

11th Conference of Italian Researchers in the World

Houston Feb 26-27, 2016

Scroll down to find Bios and abstracts of speakers.

## **PARTICIPANTS (in alphabetic order)**

**Alessandro Alabastri, Ph.D.** ----- [Alessandro.alabastri@rice.edu](mailto:Alessandro.alabastri@rice.edu)

Nordlander Nanophotonics group Physics and Astronomy Department, Rice University,  
Houston, TX

### Nanophotonics Enhanced Steam Generation and Water Desalinization

Water evaporation is the fundamental process at the base of the hydrological cycle which regulates the global movement of water, affects the climate and basically keeps Earth alive. Evaporation from the ocean is necessary to purify water and to remove its salty content so that the land can be regularly supplied with fresh (and possibly drinkable) water. While being a simple and natural process, water evaporation is, in its spontaneous form, highly energy demanding and slow. The reason relies on water relatively large specific heat and vaporization latent heat which lead, at ambient conditions, to a limited evaporation rate. Considering that 1.1 billion people in the world lack access to an efficient drinking water supply and that the Oil & Gas industry produces 14 billion of barrels of wastewater annually (~70,000 liters per second), the development of efficient methods for water purification represents an urgent challenge for scientists and engineers. In this context evaporation can play a major role since water, when turned in its gaseous form, is purified from non-volatile components (such as pollutants or salt) which can be otherwise present in its liquid phase. At this purpose, it was recently found that broadly absorbing metal or carbon nanoparticles, when mixed with water, greatly enhance the evaporation rate if the solution is placed under focused sun irradiation. In fact, dispersed particles close to the water surface, by a combined effect of photons absorption and scattering, are capable to convert light into localized heat within a thin region close to the liquid/air interface. This phenomenon tremendously accelerates the evaporation mechanism since only the water surface is heated while the bulk of the liquid does not absorb thermal energy, leading to an effective layer-by-layer vaporization process. I am currently involved in a project regarding the application of these concepts to sun-powered water treatment devices. In fact, a recently established consortium, the NEWT (Nanotechnology Enabled Water Treatment) Center, led by Rice University in collaboration with three universities (Yale, ASU and UTEP) and numerous industrial and government partners, aims at developing off-the-grid water treatment systems to provide clean water both for residential and industrial use. In particular, my research activity deals with the development of a numerical model which integrates the heating delivered by nanoparticles immersed in a fluid with a membrane distillation device capable to separate water from non-volatile elements. The aim of my work is to deeply comprehend the heating transport mechanism between nanoparticles and water and its role played in the vaporization process. At this purpose I am developing a model which can furthermore simulate a membrane distillation device in order to replicate experimental results and maximize the system efficiency. The possibility to exploit sun irradiation for water distillation paves the way for movable, electricity independent and environmentally sustainable water treatment equipment.

### *SHORT BIO*

Since April 2015 Dr. Alabastri works as a Postdoctoral Researcher in the Physics and Astronomy department at Rice University. His research area is Theoretical Nanophotonics. He obtained his B.Sc (2007) and M.Sc (2009) in Engineering Physics from Politecnico di Milano with a thesis on Metamaterials realized at the Technical University of Denmark (DTU). He then earned the Ph.D in Nanosciences (2014) from Italian Institute of Technology (IIT) and University of Genova with a thesis on the temperature dependence and heating properties of plasmonic nanostructures. His research is focused on theoretical and computational aspects of plasmonic nanostructures including optical, magnetic and heating processes.

**Rodolfo Ambrosetti** ---- [rambrose@us.ibm.com](mailto:rambrose@us.ibm.com)

IBM System

### Data Science: what is and how and where it can be applied -

How mortgage companies decide to sell package of mortgages that consider potentially non profitable in the future? And how telecommunication companies optimize the proposals offered to their prospect customers? These decisions, and others, have been made more efficient thanks to a new discipline (you can call it "science" or "technology", depending upon your particular interpretation of these two terms), called "Data Science", "Big Data" or "Business analytics" or in many other ways.

The birth of this new discipline has been allowed by two main factors:

- the possibility, provided by the evolution of Information technology hardware and software capabilities, to efficiently store and process amount of data of a size unbelievable only few years ago
- the diffusion of the "social network", allowing the collection of raw data in a very economical way, because often are the "producers", more or less spontaneously, offering data

These two conditions are just the starting point, because from "data" you must extract "information". Several techniques have been and are still introduced: we are just watching the sunrise of this discipline, that at the same time attracts corporations eager to optimize their marketing approaches, software companies offering more and more sophisticated tools and, finally, researchers that see an opportunity to apply techniques and methodologies often used in other fields that can be very useful in this area.

Some examples of techniques, application scenarios and open issues in "Data Science" are illustrated as connections to problems apparently very different but that, at their core, face the same challenges and require similar techniques.

#### *SHORT BIO*

With a degree in Mathematics, after having spent four years as Assistant Professor at Rome University "La Sapienza", Rodolfo joined IBM in 1977. After a short experience as a system engineer in Rome he was moved to Paris (France) for an assignment in a mathematical optimization team. During that period, and subsequently in Rome, he cooperated with the IBM T. Watson Research Center and the IBM Scientific Centers in Madrid and Pisa (Italy). Subsequently he spent six years in Cagliari (Italy) as Manager of technical operations in an IBM joint venture, where he was part of the team that established the Centro di Ricerche e Studi Superiori in Sardegna (CRS4). Back to the IBM Rome Software Development Lab, he managed large development projects before moving to Austin, Texas, where from 1996 up to 2008 he was responsible for several development organizations, including one dedicated to the pervasive computing. Before being appointed Director of the IBM Cairo technology development center he was co-responsible for the foundation of the IBM Software Lab in Krakow (Poland) that

subsequently managed as its functional manager. He is now responsible for the IBM Hybrid Cloud Lab Services for Latin America. Rodolfo Ambrosetti is member of the Advisory Committee of the Italy-American Chamber of Commerce - Texas and of the Board of Directors of TexHealth - Central Texas.

**Com. Vincenzo Arcobelli** --- twitter@VinceArcobelli

Representative of the General Counsel of Italians Abroad (CGIE) for the USA, Dallas, TX

### L'Emigrazione Italiana in America e nel Mondo.

Da prima dell'unificazione al periodo post bellico, e a quello del crash economico, l'Italia si è caratterizzata come terra di partenza con diversi flussi migratori, uomini e donne alla ricerca di terre promesse e da scoprire. Le tragedie e i drammi vissuti da questi nostri antenati sono eventi da non dimenticare e che fanno parte della nostra storia. Questo contributo analizzerà anche la migrazione italiana più recente, quella di oggi per la quale molti giovani lasciano il paese per poter trovare un posto di lavoro e le condizioni per poter realizzare i loro sogni dopo gli studi. Si analizzeranno i nuovi dati statistici emergenti relativi all'emigrazione italiana moderna.

### *SHORT BIO*

Vincenzo Arcobelli was born in Catania and lived until the age of 18 in Paternò (CT) . After graduating from l'ITAER "A. Ferrarin", he enrolled in the "Folgore" and then as an Officer of the Air Force. In 1993, he left Air Force and Italy to move to the United States of America. He worked in the USA with companies in the import and marketing of Made in Italy products. Since 1998 is Commander Pilot Instructor of Civil Aviation, is in charge as Flight Safety Officer and as an investigator.

Involved in social and community activities with different functions, he helped founding several no-profit organizations with the Regional Emigration association, with the Association of Sicilian Texas, with the Confederation of Sicilians in North America (CSNA), with "Birdie for Life" with the construction and support of a hospital in North Africa, and with the Comitato Tricolore Italiani nel Mondo (CTIM) in Texas for the defense and protection of the rights of our compatriots.

Vincenzo has been for almost 11 years COM.IT.ES first elected President of the consular district of Houston. He also served as the coordinator of all the COM.IT.ES presidents of the representations in the United States. He has contributed to raising the level of attention in regard to our community through activities and events that took place in our district over the years of service, to name a few: the Conference of Italian Researchers in the World, the first parade of Columbus Day in Texas, a strong promotion of the Italian language and culture, with film screenings, concerts, art exhibitions, photographic, culinary, traditional and historical events, with the intent to enhance and promote our national identity. All events recognized and appreciated by the highest authorities Italian and Texan. On September 26th, 2015, during the "Assemblea Paese" USA in Washington D.C., is elected Representative of the General Counsel of Italians Abroad (CGIE) for the USA. He lives in Dallas/Ft Worth, Texas.

**Richard Armstrong, PhD** ---- [Richarda@central.uh.edu](mailto:Richarda@central.uh.edu)

Honors College at the University of Houston. Houston, TX

### Crisis and the University: Responses to the Real World

This panel discusses UH faculty and student responses to the current refugee crisis in Europe as an example of the new synergy between research and service-learning. Richard Armstrong will introduce his co-presenters, and Prof. Carl Lindahl, whose work on disaster-victim and refugee narratives has found new therapeutic benefits, and Pietro Cicalese the student co-founders of the Global Humanitarian Student Initiative (GHSI), who are focusing their student-led efforts to aiding migrants currently housed in Sicily. Prof. Lindahl will detail his collaboration with colleagues in Palermo and Bologna in developing his new Who We Are project, which focuses in particular on migrants in Italy and Scandinavia. Pietro Cicalese's experiences in humanitarian service organizations inspired him to create this group, emphasizing the student's role in the planning and execution of service projects. He believes that students have the capacity and will power to manage and maintain service projects without having to rely on third party entities, which require additional monetary investment. He understood this when he travelled to Haiti with the student group called Friends of Haiti (FOH), where he played a powerful role alongside other students to provide quality healthcare with the help of medical professionals. This experience drove him to undergo other projects with GHSI, including a service trip to the island of Sicily in the summer of 2016 to help the migrant and refugee populations that are found there.

### *SHORT BIO*

Richard H. Armstrong (BA, University of Chicago, M. Phil., Ph.D. Yale University) is Associate Professor of Classical Studies and Coordinator of International Programs for the Honors College at the University of Houston. His most recent book is *A Compulsion for Antiquity: Freud and the Ancient World* (Cornell UP, 2006). He has published extensively on the reception of ancient culture, translation studies, and the history of psychoanalysis. He is currently writing a book titled *Theory and Theatricality: Classical Drama and the Culture of Early Psychoanalysis*. He is coeditor with Paul Allen Miller of the Ohio State UP series, *Classical Memories / Modern Identities*; contributing editor, *American Imago*; and book review editor, *Classical and Modern Literature*.

**Eleonora Bartoli, PhD.** ---- [eleonora.bartoli@uth.tmc.edu](mailto:eleonora.bartoli@uth.tmc.edu)

Department of Neurosurgery, University of Texas Health Science Center at Houston, TX

### Brain dynamics during cognitive control: insights from human intracranial recordings

A unique feature of humans is represented by the ability to adapt very rapidly to changes in the environment by modifying behavior. The inhibition of an automated response represents a particular skill within the broad domain of cognitive control, defined as the ability to control and adapt behavior according to rules and goals. To study the brain process underlying the ability to adjust behavior dynamically, the classic cognitive control experiments require participants to inhibit an automatic and overlearned process (e.g., read a word), in order to accomplish task rules (e.g., name the color in which the word is printed in place of reading). The brain dynamics underpinning the execution of these experiments have been widely studied, revealing a key role of the frontal lobe and in particular of prefrontal cortex, which, intriguingly, is one of the most recent brain areas in terms of phylogeny. However, the different roles played by distinct regions within the prefrontal cortex are difficult to disentangle, mainly because of the trade-off between temporal and spatial resolution of non-invasive neuroimaging techniques. Indeed, functional MRI (fMRI) can be used to track the brain activation at a very precise spatial location, but the time-course cannot be resolved under a few seconds. Electroencephalography (EEG) gives a millisecond time resolution, but lacks an adequate spatial resolution to identify precisely adjacent brain regions.

In my research, I study cognitive control in a cohort of patients undergoing clinical monitoring for epilepsy surgery with intra-cranial EEG recordings (icEEG), a technique with both high spatial (the implanted electrodes record from volumes of 4 mm of grey matter) and temporal (millisecond) resolution. From the voltage values recorded from the intra-cranial electrodes, spectral decomposition techniques are applied to obtain information regarding power in given frequency bands, corresponding to brain oscillatory activity. In particular, power changes in the gamma (60-120 Hz) and beta (13-30 Hz) frequency bands are calculated and used to characterize the time-course of activity throughout a distributed cortical network, evidencing the signature of cognitive control in different subregions of prefrontal cortex according to the difficulty of the task and to errors in controlling behavior. By characterizing the recruitment of prefrontal cortex, we gain knowledge on the mechanisms underlying complex behaviors in the human, which will benefit in the understanding of neurological and psychiatric pathologies affecting the frontal lobe (e.g., frontal lobe damage, fronto-temporal dementia, obsessive-compulsive disorders). Overall, this research provides new insights on the early and tight interplay between medial and lateral prefrontal regions during the engagement and the implementation of cognitive control. Understanding frontal lobe mechanisms can lead to more precisely targeted treatments for the symptoms related to a lack of control on unwanted behaviors, as the treatment of compulsions with brain stimulation techniques.



## *SHORT BIO*

Dr. Bartoli's primary research interest is the neurophysiology of the human motor system, in particular the understanding of the code used by the motor system to produce and control behavior and language and in the interplay of different cognitive functions with the motor system. She approached this research field during her university studies at the San Raffaele Vita-Salute University in Milan, by working on the interactions between language processing and action execution. Thereafter she enrolled in a graduate program at the Italian Institute of Technology in Genova, which gave her the possibility to investigate the characteristics of motor cortex recruitment during speech and visual objects processing. She then started her postdoctoral experience by joining the University of Texas Health Science Center at Houston to study prefrontal control of behavior, by means of a collaboration with the University of California, San Diego. Thus, her research interest and expertise is related to motor and premotor regions control of movements and the interaction of these with brain networks implementing different complex cognitive functions, such as cognitive control and language processing.

**Lorenzo Boninsegna, MS** ---- [lb18@rice.edu](mailto:lb18@rice.edu)

Department of Chemistry, Rice University, Houston, TX

### Molecular Dynamics (MD) simulations

It is well known that structure is a key concept in molecular sciences. Most active biological components like enzymes or DNA must take on a very specific three dimensional structure to be fully operating (think about DNA double helix). Analogously, 'mis'-folding to an alternative stable configuration, for instance due to a mutation in the amino acid sequence, means that the protein interacts with other subunits in an incorrect way, possibly leading to severe health conditions in worst case scenario. Understanding (and possibly predicting) the ensemble of stable structures a protein can (mis)fold to and the features of those transitions is then extremely relevant in molecular biology. The way theoreticians tackle the problem is to run Molecular Dynamics (MD) simulations, that is the dynamics of a given protein is 'simulated' on a computer, and snapshots of what is going on are regularly recorded as time goes by. My research has mainly involved both enhancing simulation performance and designing tools to help interpret results, with a recent focus on the latter. Molecular systems consist of many atoms (each of them carrying a set of x, y, z coordinates): all the coordinates are recorded as a function of time during a MD simulation for many time steps, meaning the final dataset to work with is likely to be almost intractable. A brute force analysis approach is then unfeasible: one could even argue that the system is described with such high resolution, that secondary details corrupt the big picture. Indeed, one is usually interested in capturing and understanding the collective process taking protein from configuration A to a different (possibly unknown) configuration B, rather than bookkeeping all the fast atomic details. We mainly wonder about the protein forming a helix or a beta sheet and which part folds first; asking ourselves how the specific trajectory of a given atom looks like in the process is completely irrelevant and would compromise the global understanding. Being able to filter the information from the simulations in a coherent way such that collective physics of the process(es) is preserved while discarding those details that do not add to the big picture is then crucial. In my work, I contribute to the discussion by designing innovative techniques that are able to accomplish just that.

### *SHORT BIO*

I was born in Rovereto (TN) on 12/15/1987 and was raised in Dro, a small town in Trentino close to Lake Garda. After graduating at Liceo Scientifico A. Maffei in Riva del Garda, I did my undergrad in Physics at Università degli Studi di Trento. I then received my Masters Degree in Theoretical Physics both from the Università degli Studi di Trento and the Eberhard Karls Universität Tübingen (Germany) within the 'Programma Doppia Laurea' (2009-2012), long established between the two partner universities. I was admitted in Rice University Chemistry PhD program here in Houston in 2013 and have been working on Physical Chemistry research under the supervision of Dr. Cecilia Clementi since then.

## **Antonello Bonci, MD**

Scientific Director, NIDA; Director, Intramural Research Program, NIDA; Johns Hopkins Bayview Campus, Baltimore, MD

Cellular memory, Optogenetics, and a novel treatment against cocaine abuse

### *SHORT BIO*

Dr. Bonci joined the National Institutes of Health (NIH) in 2010 as Scientific Director of the National Institute on Drug Abuse (NIDA). He was professor in residence in the Department of Neurology at the University of California, San Francisco (UCSF) and held the Howard J. Weinberg Endowed Chair in Addiction Research; as well as Associate Director for Extramural Affairs at the Ernest Gallo Clinic and Research Center. His laboratory was the first to demonstrate that drugs of abuse such as cocaine produce long-lasting modifications on the strength of the connections between neurons. This form of cellular memory is called long-term potentiation (LTP.) This finding cast a new light on the phenomenon of drug addiction, which could now be seen as a process of maladaptive learning and memory at the cellular level. In turn, this information helped explain why drug taking can often become such a long-lasting phenomenon, with relapse occurring even several years after the last encounter with a drug. His most recent work has used a combination of electrophysiology, optogenetic, molecular and behavioral procedures to keep on studying the basic cellular mechanisms and circuits underlying reward and substance use disorders.

Over the last 15 years, the main goal of his laboratory has been to elucidate the role of long-term plasticity at excitatory synapses in the limbic system in modulating the development and expression of cocaine, stress and alcohol-dependent behaviors, in order to produce novel therapeutic strategies that could reverse these long-term synaptic changes, and as a consequence, drug-dependent behaviors. His team has published a series of studies focused on this topic. These studies pioneered the field of drug-dependent synaptic plasticity, and have strongly influenced the research of all laboratories interested in substance use disorders and plasticity. In fact, drug-dependent synaptic plasticity is thought to be a key cellular phenomenon underlying substance use-dependent behaviors.

A second line of research of his laboratory has focused on determining the pathways that are causally responsible for modulating reward- and cocaine-dependent behaviors. While it is extremely important to understand and elucidate the cellular basis for reward and cocaine-dependent plasticity, it is equally important to determine the contribution of limbic pathways in shaping these behaviors. Furthermore, through the development of optogenetics by Deisseroth, Zhang and Boyden a few years ago, and the diffusion of rTMS, the data collected from his laboratory had offered us unprecedented opportunities to design clinical trials aimed at restoring physiological activity from brain regions that are severely affected by cocaine exposure. The very first of these clinical trials, based on his group's optogenetic work (Chen et al., 2013), is under submission, with very promising results.

**Maria Elena Bottazzi, Ph.D., FASTMH ---- [bottazzi@bcm.edu](mailto:bottazzi@bcm.edu) ; Twitter @mebottazzi**

National School of Tropical Medicine; Pediatric Tropical Medicine & Molecular Virology & Microbiology, Baylor College of Medicine and Texas Children's Hospital; Department of Biology, Baylor University, Houston, TX

The Link between Parasites and Poverty: Combating Neglected Tropical Diseases accelerating translation of discoveries into new vaccines

The neglected tropical diseases (NTDs) are the most common infections of the poorest 120 million people in the Americas who live on less than US\$2 per day. They include ancient scourges such as hookworm and other soil-transmitted helminth infections, Chagas disease, amoebiasis, schistosomiasis, leishmaniasis, and dengue. Together, these NTDs produce a burden of disease in the western hemisphere that in certain regions even exceeds HIV/AIDS, while simultaneously trapping Latin America's "bottom 100 million" in poverty through their deleterious effects on child physical and intellectual development, pregnancy outcome, and worker productivity. The high prevalence and incidence of the major NTDs afford an opportunity for joint cooperation and alliances to address the highest prevalence conditions and accelerate the development of alternative control tools for the major NTDs. One of the major hurdles in the critical path for the development and testing of novel and translational discoveries is overcoming the "valley of death", or product development gap for taking a bench discovery to the point where it shows a clear path to the clinic. A perspective of a sustainable model to accelerate translation of discoveries into new vaccines and applied by the Sabin Vaccine Institute and Texas Children's Hospital Center for Vaccine Development, a product development partnership (PDP) founded to develop recombinant protein vaccines targeting NTDs will be presented. In addition, the mission and vision of the newly established National School of Tropical Medicine at Baylor College of Medicine for training the next generation of health professionals will also be discussed.

*SHORT BIO*

Dr. Bottazzi is the Associate Dean of the National School of Tropical Medicine and Professor of Pediatrics and Molecular Virology & Microbiology at Baylor College of Medicine in Houston, Texas. She also directs the Research and Administration of the Section of Pediatric Tropical Medicine. She is the Deputy Director for the Sabin Vaccine Institute and Texas Children's Hospital Center for Vaccine Development, which is Sabin Vaccine Institute's Product Development Partnership (PDP). Dr. Bottazzi is an internationally-recognized scientist with more than 13 years of experience in translational research and vaccine development for neglected tropical diseases. In addition, her major interest is in the role of vaccines as control tools integrated into international public health programs and initiatives. Dr. Bottazzi is the Editor in Chief of Current Tropical Medicine Reports, Springer, US and an Associate Editor for Public Library of Science (PLoS) Neglected Tropical Disease Journal. She is the author or co-author of more than 60 scientific and technical papers in molecular, cellular biology, immunoparasitology, and vaccine development and is the recipient of multiple extramural awards. Dr. Bottazzi is a member of the International Advisory Committee of the Carlos Slim Health Institute in Mexico and a member of the Bill and Melinda Gates Foundation Product Development (CMC) Working Group. Dr. Bottazzi is a Fellow of

the Hedwig van Ameringen Executive Leadership in Academic Medicine (ELAM) Program. She is also one of the Executive Co-directors advancing the efforts of the Global Chagas Disease Coalition. She was born in Genova, Italy and later relocated to Tegucigalpa, Honduras where she obtained her degree in Microbiology and Clinical Chemistry in 1989 from the National University of Honduras, followed by her PhD in Molecular Immunology and Experimental Pathology at the University of Florida in Gainesville, FL in 1995. Her post-doctoral training in Cellular Biology was completed during 1995-2001 at University of Miami and University of Pennsylvania. Her academic tenure initiated in 2001 at the George Washington University in Washington DC where she served for 11 years ultimately becoming an Associate Professor and Vice-Chair for Administration in the Department of Microbiology, Immunology and Tropical Medicine.

**Massimo Catalano, PhD** ---- [massimo.catalano@utdallas.edu](mailto:massimo.catalano@utdallas.edu)

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#### Aberration Corrected Electron Microscopy Study 2D Transitional Metal Dichalcogenides (TMDS)

M.Catalano, Ning Lu, Juan Pablo Oviedo, Guoda Lian, and Jinguo Wang and Moon J. Kim,

Material dimensionality plays a crucial role in determining material physical properties. Research in graphene and the methodology of preparing ultrathin layers has led to the exploration of other 2D materials. In particular, single layers of transition metal dichalcogenides (TMDs) with lamellar structures similar to those of graphite have drawn significant attention because of their tunable bandgaps. TMDs exhibit diverse properties that depend on their composition: semiconductors (e.g., MoS<sub>2</sub>, WS<sub>2</sub>), semimetals (e.g., WTe<sub>2</sub>, TiSe<sub>2</sub>), metals (e.g., NbS<sub>2</sub>, VSe<sub>2</sub>), or superconductors (e.g., NbSe<sub>2</sub>, TaS<sub>2</sub>). TMD properties strongly depend on the crystalline structure, including the number and stacking sequence of layers. Though electrical, mechanical, and magnetic studies of 2D materials as new material systems are being conducted, there is an evident lack of direct atom-by-atom visualization, limiting insight on these highly exciting material systems. Here, we present our recent studies on the characterization of 2D layered materials by means of Scanning Transmission Electron Microscopy (STEM), specifically High Angle Annular Dark Field (HAADF) imaging and *in-situ* Transmission Electron Microscopy (TEM). We have identified the atomic arrangements and defects in single layer MoS<sub>2</sub>, 2H stacked TMDs (MoS<sub>2</sub>, MoSe<sub>2</sub>, WSe<sub>2</sub>, and MoTe<sub>2</sub>), 1T stacked TMDs (SnS<sub>2</sub>, SnSe<sub>2</sub>, HfSe<sub>2</sub>, and HfS<sub>2</sub>), and distorted 1T stacked TMDs (WTe<sub>2</sub>) by HAADF STEM imaging. The location and nature of individual atoms, defects, and layer by layer shearing of 2D crystals will be presented and discussed in detail.

#### *SHORT BIO*

Massimo Catalano was born on November 27th, 1963 in Lecce, in the beautiful Puglia. He graduated in Physics in the University of Lecce, discussing a thesis on the characterization of extended defects in III/VI semiconducting compounds. After getting his degree he spent two years at Arizona State University, working with Prof. R. W. Carpenter and Prof. Moon J. Kim and learning the fundamentals of High Resolution Transmission Electron Microscopy and Electron Energy Loss Spectroscopy. He is author of several publications in the field of the structural and chemical characterization of materials and devices, mainly low dimensional materials such as quantum wires, wells, dots, nanoparticles in several matrices. He was vice president of the Italian Society for Microscopy for several years, and director of the journal of the society, and is now responsible of the structural characterization of materials and devices and nanofabrication



laboratory at the Institute for Microelectronics and Microsystems of the National Council for Research in Lecce. He presently works as a visiting scientist at University of Texas at Dallas.

**Davide Cattano, MD. PhD.** ---- [Davide.Cattano@uth.tmc.edu](mailto:Davide.Cattano@uth.tmc.edu)

Department of Anesthesiology, UTHealth Medical School, Houston, TX

**Echogenic Endotracheal Tubes and Laryngeal Mask Airways: A Reality?**

Jacek A. Wojtczak, M.D.,Ph.D.<sup>1</sup>, Davide Cattano, M.D.,Ph.D.<sup>2</sup>

<sup>1</sup>University of Rochester School of Medicine and Dentistry, Rochester, New York; <sup>2</sup>UTHealth Science Center, Houston, Texas, United States

Disclosures: J.A. Wojtczak: None. D. Cattano: None. The abstract and respective poster was presented at Anesthesiology 2015, San Diego October 23rd-28th, 2015.

**INTRODUCTION.** Recently successful ultrasound-guided tracheal intubations (UGTI) without the use of a laryngoscope were described in pediatric patients [1]. Endotracheal tubes (ETT) and laryngeal mask airways (LMAs) are echolucent and are poorly visualized during the upper airway sonography (Fig. 1 A and B). The purpose of this study was to develop echogenic ETTs and LMAs that can be used during UGTI in patients with difficult airways and after failed laryngoscopy. Ultrasonic visualization of the LMA in the upper airway may be useful in its correct sizing and placement. HODS. Sheridan # 8 ETT and size 3 LMA Unique (Teleflex, Inc.) were: 1). immersed in a water bath or embedded in gelatin, 2). placed in the trachea or supraglottic space of pig laryngo-tracheal specimens. BK Medical Flex Focus 400 ultrasound system with 5 MHz curved and 15 MHz linear probes was used for scanning. A layer of the nanoparticle coating (NC) developed by us was applied to the ETT and the LMA.

**RESULTS.** The nanoparticle coating markedly enhanced echogenicity of the ETT and the LMA, but the applied layer was relatively thick and coarse. Our technology requires further improvements and a toxicity testing of the coating.

**DISCUSSION.** This study describes the first attempt to develop echogenic ETTs and LMAs using nanoparticle coating. Custom designed echogenic needles and catheters are now used during ultrasound-guided nerve blocks and intravascular procedures. Therefore, this technology is widely available and can be applied to airway devices. Echogenic ETTs may become useful during UGTI or for the verification of the ETT position in the trachea during cardiopulmonary resuscitation or in the ICU.

1. Fiadjoe J et al. Anesthesiology 2012; 117: 1389.

Figure 1

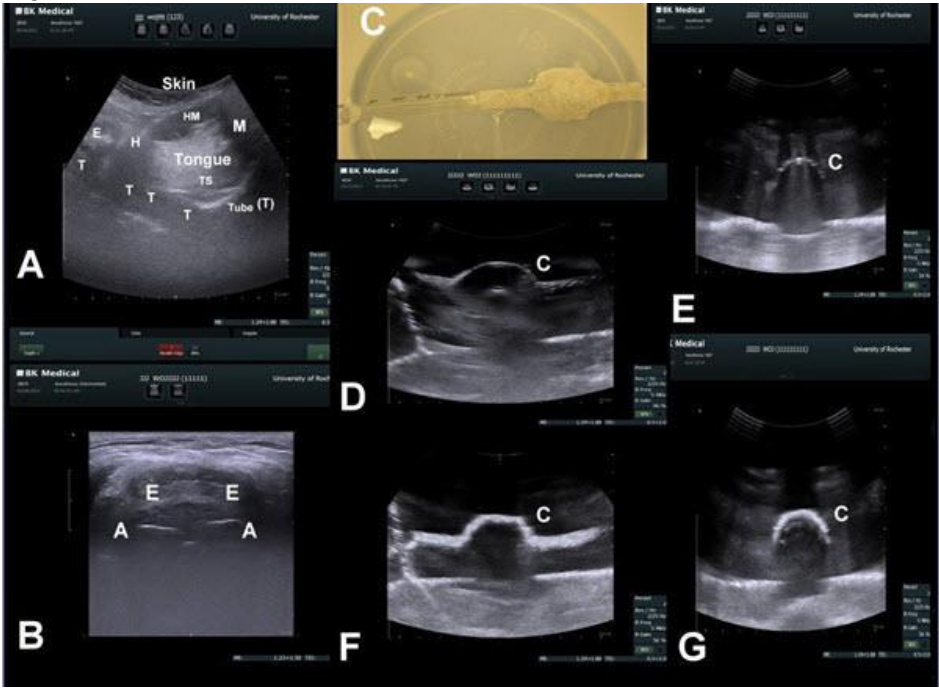
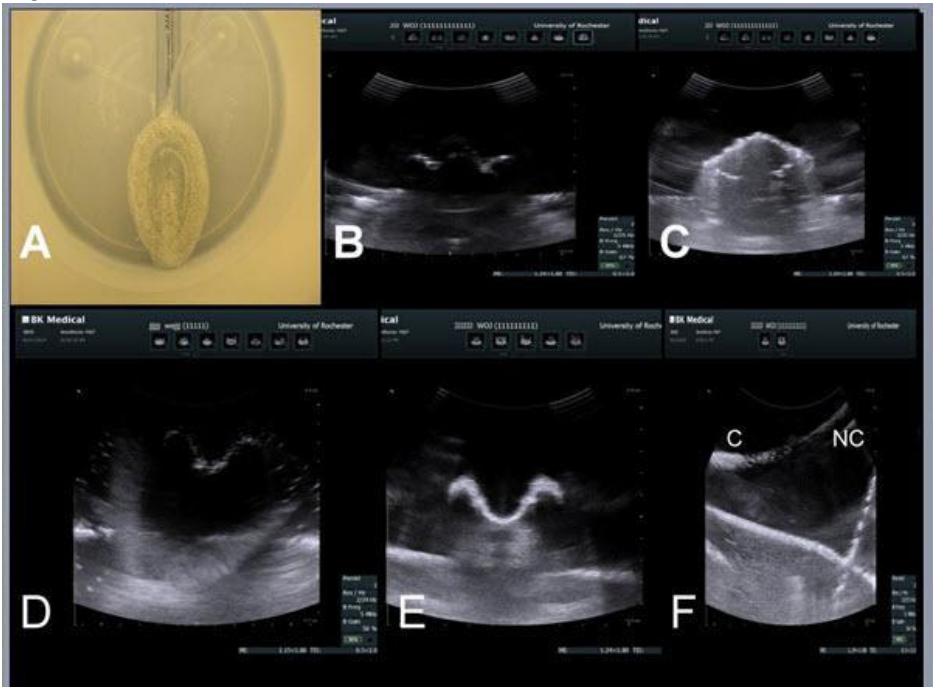


Figure 2





## *SHORT BIO*

Davide Cattano, M.D., Ph.D. is born in Rome, Italy (1974). He grew up in Rome and graduated from Università Campus Bio Medico of Rome, Italy, Magna Cum Laude in 1999. After completing medical school he moved to the University of Pisa and he graduated in Anesthesiology, Intensive-Critical Care Residency Program at the University of Pisa Medical School, Magna Cum Laude (2003), with an experimental thesis on the neuroprotective and neurotoxic effect of gas xenon, which granted him an award from Abbott, best graduation thesis for the residency programs of Tuscany. Dr. Cattano obtained his Ph.D. in Morphology and Physiology and Pathophysiology of Cells and Tissues in the Department of Human Morphology and Applied Biology, University of Pisa, Italy (2007). His graduation thesis on the neurotoxic effects of the anesthetic Propofol in neurodevelopment age was published as monography.

Dr. Cattano is currently an Associate Professor in the Department of Anesthesiology and Director of Clinical Research at The University of Texas Medical School at Houston. He is also the medical director of the Preoperative Anesthesia Clinic Memorial Hermann Hospital and service Chief for ENT/OMF, plastic and eye surgery. He is nationally and internally recognized clinician and expert in airway management and coagulation, and perioperative quality/safety improvement patient's advocate.

## **On Mario Caruso**

Deputy Italian Parliament; Defense Committee Member

### Contributo delle Forze Armate Italiane alla sicurezza e ricerca tecnologica

#### *SHORT BIO*

L' On.Mario Caruso e' nato a MILITELLO IN VAL DI CATANIA (CATANIA), il 3 settembre 1955  
Diploma di istituto professionale per l'industria e l'artigianato; Funzionario responsabile patronato assistenza.

ELETTO NELLA CIRCOSCRIZIONE A (EUROPA)

#### ISCRITTO AL GRUPPO PARLAMENTARE

- DEMOCRAZIA SOLIDALE - CENTRO DEMOCRATICO dal 10 dicembre 2013
- SCELTA CIVICA PER L'ITALIA dal 19 marzo 2013 al 10 dicembre 2013

#### UFFICI PARLAMENTARI:

- SEGRETARIO della COMMISSIONE PARLAMENTARE DI CONTROLLO SULL'ATTIVITA' DEGLI ENTI GESTORI DI FORME OBBLIGATORIE DI PREVIDENZA E ASSISTENZA SOCIALE dal 17 ottobre 2013
- SEGRETARIO del COMITATO PERMANENTE SULL'ATTUAZIONE DELL'AGENDA 2030 E GLI OBIETTIVI DI SVILUPPO SOSTENIBILE dal 16 luglio 2013 al 17 febbraio 2014

#### COMPONENTE DEGLI ORGANI PARLAMENTARI:

E' Membro attualmente della

- IV COMMISSIONE (DIFESA) dal 5 agosto 2015
- COMMISSIONE PARLAMENTARE DI CONTROLLO SULL'ATTIVITA' DEGLI ENTI GESTORI DI FORME OBBLIGATORIE DI PREVIDENZA E ASSISTENZA SOCIALE dal 21 giugno 2013
- COMMISSIONE PARLAMENTARE DI INCHIESTA SUI FENOMENI DELLA CONTRAFFAZIONE, DELLA PIRATERIA IN CAMPO COMMERCIALE E DEL COMMERCIO ABUSIVO dal 7 marzo 2014
- X COMMISSIONE (ATTIVITA' PRODUTTIVE, COMMERCIO E TURISMO) dal 17 febbraio 2014 al 5 agosto 2015
- III COMMISSIONE (AFFARI ESTERI E COMUNITARI) dal 7 maggio 2013 al 17 febbraio 2014

**Pietro Antonio Cicalese** ---- [pietrocicalese134@gmail.com](mailto:pietrocicalese134@gmail.com)

University of Houston, Houston, TX

### Crisis and the University: Responses to the Real World

This panel discusses UH faculty and student responses to the current refugee crisis in Europe as an example of the new synergy between research and service-learning. Richard Armstrong will introduce his co-presenters, and Prof. Carl Lindahl, whose work on disaster-victim and refugee narratives has found new therapeutic benefits, and Pietro Cicalese the student co-founders of the Global Humanitarian Student Initiative (GHSI), who are focusing their student-led efforts to aiding migrants currently housed in Sicily. Prwill detail his collaboration with colleagues in Palermo and Bologna in developing his new Who We Are project, which focuses in particular on migrants in Italy and Scandinavia. Pietro Cicalese's experiences in humanitarian service organizations inspired him to create this group, emphasizing the student's role in the planning and execution of service projects. He believes that students have the capacity and will power to manage and maintain service projects without having to rely on third party entities, which require additional monetary investment. He understood this when he travelled to Haiti with the student group called Friends of Haiti (FOH), where he played a powerful role alongside other students to provide quality healthcare with the help of medical professionals. This experience drove him to undergo other projects with GHSI, including a service trip to the island of Sicily in the summer of 2016 to help the migrant and refugee populations that are found there.

### *SHORT BIO*

Pietro Antonio Cicalese was born in Treviso, Italy to Cristiana Rastellini and Luca Cicalese. His family migrated to the United States when he was only a few months old, and he was naturalized as a US citizen when he was ten years old. He is currently a third year biomedical engineering student at the University of Houston, where he founded the Global Humanitarian Student Initiative (GHSI) alongside Dennis Kunichoff. His experiences in humanitarian service organizations inspired him to create this group, emphasizing the student's role in the planning and execution of service projects. He believes that students have the capacity and will power to manage and maintain service projects without having to rely on third party entities, which require additional monetary investment. He understood this when he travelled to Haiti with the student group called Friends of Haiti (FOH), where he played a powerful role alongside other students to provide quality healthcare with the help of medical professionals. This experience drove him to undergo other projects with GHSI, including a service trip to the island of Sicily in the summer of 2016 to help the migrant and refugee populations that are found there. After graduating, he intends to enroll in an M.D. Ph.D. program to become a neurosurgeon and neuroscientist, eventually providing the same healthcare to those in need as the medical professionals that worked with him in college.

## **Salvatore Crapanzano, MS**

Istituto Euro-Mediterraneo di Scienza e Tecnologia (IEMEST), Palermo, Italy

### Washing suit: a new approach to shower in space

Salvatore Crapanzano<sup>1</sup>, Fabio Bucchieri<sup>1,2</sup>, Francesco Cappello<sup>1,2</sup>, Maria Iudicello<sup>1</sup>

<sup>1</sup>Istituto Euro-Mediterraneo di Scienza e Tecnologia (IEMEST), Palermo, Italy; <sup>2</sup>Department of Experimental Biomedicine and Clinic Neurosciences, University of Palermo, Palermo, Italy

Although special space showers have been developed many times in the past, the need of an effective washing solution in space is extremely relevant to this day. In fact, astronauts still prefer to wash themselves by refreshing wipes or soaked towels, since any previously designed space showers lacked practicality.

The "Washing Suit" will give astronauts the possibility to have a shower which offers the same feeling of relaxation and cleaning typical of on-ground showers, without dispersing jets and droplets of water into the surrounding environment.

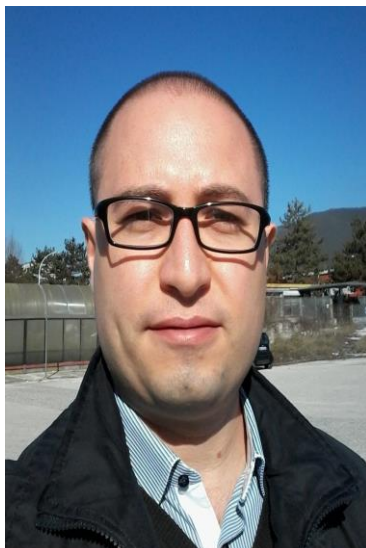
The "Washing Suit" will allow astronauts to wash, rinse and dry with a small quantity of water and without the inconvenience of using masks to breathe or aspirators to dry.

Everything necessary will be integrated into the proposed system, which, with simple commands, will allow astronauts to adjust the water temperature and flow, the amount of soap and the air flow required for drying, either manually or automatically.

Low energy consumption will also be a main characteristic of the "Washing Suit", which may be easily adopted aboard the ISS or in view of a human mission to Mars.

Acknowledgements: We would like to express our gratitude to Eng. Orazio Chiarenza for his support in establishing the connections with the scientists at the Johnson Space Center of the National Aeronautics and Space Administration, Houston, TX, USA.

### *SHORT BIO*



Salvatore Crapanzano 02/19/1983, Italian. Education: July 2009, Master's degree in Aerospace Engineering at the "Politecnico di Torino". October 2005, Bachelor's degree in Aerospace Engineering at the "Politecnico di Torino".

Current Position: Researcher at the Euro-Mediterranean Institute of Science and Technology (IEMEST). Working for Alma Sistemi since November 16th, 2015, as aerospace engineer.

Previous Positions: From February 2015 to November 2015 as "Master Quality" student. From June 2014 to July 2014, SERCO (ESA) as

Configuration Controller. From April 2010 to October 2013, Configuration Control officer and Thermo-Mechanical engineer for AVIOSPACE. From March 2007 to August 2007, student intern for "CNES".

**Antonino Cucchiara, PhD.** ---- [antonino.cucchiara@nasa.gov](mailto:antonino.cucchiara@nasa.gov); [acucchiara@stsci.edu](mailto:acucchiara@stsci.edu)

Space Telescope Science Institute/ NASA-GSFC

### First Stars and Galaxies: The Quest Begins

I will present past and current results in the discovery of the peculiar class of astronomical explosion called Gamma-ray Bursts (GRB). In particular the discovery of GRB090429B, which is as of today the furthest single-star event ever observed by astronomers: we estimate that the explosion occurred only 600 million years after the Big Bang. The ongoing search for more of such object will reveal the nature of the first stars, the first galaxies ever formed, and give us unique insights on the formation of all matter we can see in the Universe. Research Summary In the next decade a new generation of astronomical satellites and ground-based telescopes will enable to study directly the first stars and the galaxies where they live in. As of today, only a handful of galaxies have been confirmed to be in the redshift range  $z=8-10$ , which means that these galaxies have been assembled during the first 600 million years of the Universe history. GRBs, instead, have such properties that allow us to detect them at even earlier times, and so to promisingly pinpoint to the very first stars (and galaxies) formed in the Universe (around 2-300 million years after the Big Bang). GRBs explosion are the brightest object in the gamma-ray sky (during the first few seconds) and therefore can be seen at large distances. Furthermore, because of their nature they may be part of the first generation of stars produced after the Big Bang. Identifying such objects and determining their environment properties (their host galaxies) represent the most important routes to understand the origin of the Universe as we know it. In particular two GRBs, GRB090423 and GRB090429B, have been identified and study at length by our group: thanks to spectroscopic observations of the GRBs optical and infrared emission (afterglow) it has been possible to determine that GRB 090423 exploded only 630 million years after the Big Bang (or  $z=8.2$ ) confirming that GRBs are indeed tracers of very ancient stars (in accordance with several theoretical expectations). Even more, optical and NIR images of the afterglow of GRB090429B have constrained the redshift of this object to be even higher ( $z\sim 9.4$ ).

I will present our current effort to discover many more of these objects using the NASA Swift satellite, the incoming new generation of Great Space Observatories, and the largest telescopes on Earth. These data will provide crucial information on the chemistry of the early Universe, from its metal content to stars and galaxy formation.

### *SHORT BIO*

Dr. Cucchiara is current a post-doctoral fellow at the Space Telescope Science Institute in Baltimore (MD) and at the NASA – Goddard Space Flight Center. Born in Palermo, he graduated from Università Statale di Milano in 2004 and obtained his PhD from Penn State University in 2010. He worked at the UC Berkeley in 2010, UC Santa Cruz (2011-2013) and he was a NASA Postdoctoral Fellow (2013- 2015).



## **Alberto Dambruoso**

Fine Arts Academy of Foggia, Foggia, Ital

### Sui generis Migrations: Burri and Artistic avant-gardes in America and Italy

**Abstract:** In 1943, in Africa during the II World War, the English army captured several Italian soldiers who were deported to the prison camp of Hereford in Texas. Among these soldiers there was the physician Alberto Burri. In Texas, Burri currently considered by international art critics one of the most important artists of the Novecento – at the moment a retrospective of his work is on display at the Guggenheim in NYC in connection with the Centenary of the artist's birth—discovered his artistic identity. Burri's first paintings were views of the desert he could see from the prison camp. Besides organizing exhibits in the prison camp, in Texas Burri painted several paintings. After his return to Italy in 1946, in Rome Burri experimented with abstract art. In the Fifties, he had established his reputation and was visited by a young American artist Robert Rauschenberg—the man destined to become the inventor of Neo-Dadaism and one of the most important pioneer of Pop-art. Rauschenberg was the first of several: soon Burri found himself active in a network of American artists like Jasper Johns, Cy Twombly and Italian American Salvatore Scarpitta who visited and resided in Rome, eager to get to know the Italian art scene while displaying their works in Italian galleries. At the same time, during those years, a parallel “migration” in the opposite directions began: several Italian artists like Mario Schifano, Mario Ceroli, Tano Festa, Cesare Tacchi e Renato Mambor—famous exponents of the Piazza del Popolo School, the Italian equivalent of the Pop Art movement—moved to the United States for long and short periods of times. Legendary art dealer Leo Castelli moved to NYC in the Sixties. In short, beginning with Burri and his American experience, a fruitful artistic exchange was established, a sort of artistic bridge between America and Italy productively drawn.

### **SHORT BIO**

Alberto Dambruoso is an art historian, professor of Art History at the Fine Arts Academy of Foggia, and independent critic and curator of contemporary art based in Rome for over 16 years. Dambruoso graduated from the Tuscia Cultural Heritage Conservatory (Facolta' di Conservazione dei Beni Culturali della Tuscia (VT)) with a degree in Art History in 2000, and earned his teaching degree in 2007 at the Ca' Foscari University of Venice. Specializing in the Italian art scene of the 1960's, with particular focus on the Roman group "Scuola di Piazza del Popolo", Dambruoso has curated numerous solo and group exhibits featuring the artists that gave life to this fervent creative period including Schifano, Festa, Angeli, Tacchi, Lombardo, Fioroni, Ceroli, and Pascali. Working closely with Prof. Maurizio Calvesi, one the first critics to write on the new linguistics contained in the works of the "School", together they have written numerous critical essays, curated exhibits, and presented at prestigious events. Currently, Dambruoso is revising the complete catalog of works by Umberto Boccioni, a research project assigned to him by Calvesi as part of the 2008 Balzan recipient commission. In early 2010, Dambruoso created a series of events, "I Martedì Critici" (Critical Tuesdays), centered around the most prominent artists, critics, and gallerists in the Italian and international contemporary art scene. These events are held all over Italy in notable institutions such as Rome's Auditorium of Mecenatè, Chiostro del Bramante, Tempio del

Bramante, MACRO and MAXXI Museums, Milan's Pecci Museum, and Napoli's MADRE and PAN Museum.



**Paola D'Amora, PhD student**

The University of Texas at Austin, Austin, TX

The inherently uncinematic nature of white-collar employment raises more than one question about the ways in which Italian cinema has successfully represented office labor culture. In this presentation, I discuss Italian cinema's formal, narrative, and stylistic approach to the depiction of such an uninspiring filmic subject. I mainly argue that Italian films on white-collars produced between 1959 and 1983 share a remarkable tendency to portray office work's dysfunctional aspects and anomalies as a way to overcome inaction.

My research project stems from my interest for the character of the accountant Ugo Fantozzi, the emblematic, undisputed prototype of film representations of Italian white-collar workers. In my dissertation project, I investigate the socio-historical underpinnings of Fantozzi's everlasting, immediate, popularity among people from different generations and from diverse cultural backgrounds.

*SHORT BIO*

Paola D'Amora is a doctoral candidate at the University of Texas at Austin. Born and raised in Napoli, Italy, after earning her laurea triennale in Lettere at the Università degli Studi di Perugia, Paola moved to Austin in 2011 to pursue her graduate education in Italian studies. She is currently employed at UT Austin as an Italian language instructor while working on her PhD dissertation on the representation of white-collar workers in Italian cinema.

**Antonella Del Fattore-Olson** ---- [adolson@austin.utexas.edu](mailto:adolson@austin.utexas.edu)

Department of French and Italian; The University of Texas at Austin, Austin, TX

From Drama to Comedy: Exploring the Portrayal of Mafia in Italian Contemporary Films with Emphasis on *La mafia uccide solo d'estate*

The most recent Italian movies, such as *La mafia uccide solo d'estate*, portray the subject of the Italian mafia in a comic style and distance themselves from films such as *Gomorra*. In *Gomorra*, Matteo Garrone had depicted Roberto Saviano's Neapolitan camorra in an ethnographic approach through the use of long takes, leaving the audience with a sense of unavoidability. On the contrary, in the most recent films, directors chose comedy to present topics dealing with the mafia. In particular, Pierfrancesco Diliberto (Pif) in *La mafia uccide solo d'estate*, narrates the Palermo's Cosa Nostra of the 80's and 90's with comic undertones. Pif uses a fast paced editing narrative by mixing animation with live action and gives his audience a sense of openness and a feeling of optimism; he does this hoping that the historical memory will redeem the mafia's violent past.

Given the vast public approval that Pif's movie has received, one can ask whether this new genre of comedy in dealing with the topic of the South and its problems, does mirror a true change among Italians in looking at themselves in a different way. Moreover, is this movie genuinely engaged in the political and social issues concerning the mafia or is it just another mere reproduction of a reality detached from its socio-political context? This presentation intends to analyze the latest movies on the mafia, draw a comparison with the less recent ones, and search for answers to the above questions.

*SHORT BIO*

Antonella Del Fattore-Olson is a Distinguished Senior Lecturer in Italian in the Department of French and Italian, at the University of Texas at Austin, where she has been teaching since 1984. She is from Rome, Italy and has a *Laurea* in Lettere Moderne (with a thesis in Anglo-American Literature) from the University of Rome "La Sapienza." Her teaching interests are: Italian Language and Culture, Teaching Methodology, Italian Theatre, Play Production, Italian Literature, Italian dialects. She is the recipient of four teaching awards from UT-Austin and UT System.

At UT-Austin, she has been teaching courses on Italian language, culture, and theater. In 1990, she created a new course called "Italian Drama Workshop," which she offers every other year. For this course, she directed plays by Maraini, Fo, Rame, Pirandello, De Filippo, Ginzburg, Machiavelli, Marinetti, Baliani, and Celestini. Upper-division students perform the plays in Italian. In 2012, she created a signature course, taught in English, on Italian theater and literature, which is offered every fall.

Antonella is the coordinator of lower-division Italian, supervisor of intensive second-semester Italian, and, since summer 1996, director of the Rome Study Program. So far, about 600 UT students have participated in this program in Rome. She is also the faculty adviser of the Italian Club for which she organizes academic and social events and visits by Italian writers, musicians, and journalists.

Antonella co-authored *In Viaggio, Moving Toward Fluency*, second-year textbook, and participated in the writing of several first- and second-year textbooks. She also co-created *Radio Arlecchino, An Italian*

*Grammar and Culture Podcast*, an on-line resource, and was the faculty advisor for *ITAL*, a transmedia project for intermediate and upper-division students of Italian that consists of thirty videos on Italian culture; for them, she collaborated in writingscripts and vocabulary, finding related readings, and produced additional activities. Italian courses have been using ITAL videos since 2013.

The papers she presented dealt mainly with pedagogical issues such as the introduction of culture through movies and students' oral reports, Italian cinema--Pasolini, Bertolucci, Troisi, Diliberto (Pif) --and play production. She published articles on Dacia Maraini's theater and the teaching of Italian through theater.

**Enrica De Rosa, PhD.** ---- [ederosa@houstonmethodist.org](mailto:ederosa@houstonmethodist.org)

Department of Nanomedicine, Houston Methodist Research Institute, 77030, Houston, TX

### Nanoinjection by Porous Silicon Nanoneedles for Intracellular Gene Delivery *in vivo*

E. De Rosa<sup>1</sup>, C. Chiappini<sup>2</sup>, J. O. Martinez<sup>1</sup>, X.Liu<sup>1</sup>, C. Almeida<sup>2</sup>, M. Stevens<sup>2</sup>, E. Tasciotti<sup>1</sup>

1. Department of Nanomedicine, Houston Methodist Research Institute, 77030, Houston, TX
2. Department of Materials, Department of Bioengineering, Institute of Biomedical Engineering, Imperial College London, SW7 2AZ, London, UK

The controlled delivery of nucleic acids to selected tissues remains an inefficient process marked by low transfection efficacy and toxicity issues arising from the materials and procedures employed. Nanoneedles display great potential as a minimally invasive, simple, high-throughput strategy for intracellular investigation due to their versatility, ease of use and low-cost<sup>[1]</sup>. Nanoneedles can interface efficiently with cells, with minimal effects on their survival and proliferation. Nanoneedles have shown high accuracy, minimal toxicity and high efficiency for intracellular delivery of nucleic acids *in vitro*, but it has been difficult to extend these characteristics *in vivo*, since current interfacing strategies rely on complex equipment or active cell internalization through prolonged interfacing. We produced a tunable array of biodegradable nanoneedles fabricated by metal-assisted chemical etching of silicon able to interface with cells either from the bottom, by seeding the cells over them or from the top by pressing them over the cells, enabling intracellular delivery and sensing without inducing toxicity. We showed that they can access the cytoplasm to co-deliver DNA and siRNA with efficiency greater than 90%, respectively expressing and silencing genes, and that *in vivo* the nanoneedles transfect the VEGF-165 gene, inducing sustained neovascularization and a localized six fold increase in blood perfusion in a target region of the muscle. The delivery of hVEGF165 DNA to the muscle of mouse *in vivo* results in the sustained expression of the human VEGF protein for over a week, leading to the formation of new blood vessels resulting in a six-fold increase in local blood perfusion<sup>[2]</sup>.

The nanoinjection delivery mechanism is highly biocompatible and minimally invasive. Nanoinjection in skin, ear and muscle of mouse did not display any sign of alteration to tissue structure. Furthermore no sign of acute or chronic inflammation were observed<sup>[3]</sup>.

In summary, mesoporous silicon nanoneedles demonstrate the ability to efficiently deliver a broad range of therapeutic agents within cells, both *in vitro* and *in vivo*, with minimal invasiveness and elevated biocompatibility, enabling highly localized treatment. These results reveal the potential of nanoneedles for clinical translation in tissue engineering and the treatment of chronic, degenerative diseases.



[1] R. Elnathan, M. Kwiat, F. Patolsky, N. H. Voelcker, *Nano Today* **2014**, 9, 172. [2] C. Chiappini, E. De Rosa, J. O. Martinez, X. Liu, J. Steele, M. M. Stevens, E. Tasciotti, *Nat Mater* **2015**, 14, 532. [3] C. Chiappini, J. O. Martinez, E. De Rosa, C. S. Almeida, E. Tasciotti, M. M. Stevens, *ACS Nano* **2015**, 150417133816003.

### *SHORT BIO*

Dr. De Rosa was born and raised in Naples, Italy, where she graduated with full score in Chemical engineering at the Università degli Studi di Napoli Federico II. During her PhD in Biomaterial and transport phenomena, she set up and validated an advanced microscopy technique (FRAP) to locally measure molecular diffusion for drug delivery and tissue engineering application. Since she moved to Houston her interest shifted towards the nanotechnology applied to medicine: she pioneered the development of an implantable subcutaneous nanodevice for long term constant drug delivery, and of a weight bearing bio-nano-material able to regenerate the bone tissue in a critical size bone fracture. Her most recent studies include new drug delivery systems, such as nanoneedles, and intra vital microscopy investigation in different organs and tissues, such as muscle, skin, liver, pancreas and brain.

**Alberto Devoto, MS, PhD** ---- [alberto.devoto@ca.infn.it](mailto:alberto.devoto@ca.infn.it)

Department of Physics, Università degli Studi di Cagliari, Monserrato (Cagliari), Italy

### The DarkSide Collaboration and the search for Dark Matter

DarkSide-50 (DS-50), the apparatus built by the DarkSide collaboration will be described. The goals of the Collaboration and the first results obtained using DarkSide-50 will be illustrated.

DarkSide-50, the first detector of the DarkSide program, produced its first WIMP search results using atmospheric argon in December 2014. In October 2015, DS-50 produced the first WIMP search using low-radioactivity underground argon. While DS-50 continues to take data (and it will continue to do so for the next few years) research and development to build and operate a series of larger DarkSide Liquid Ar Time Projection Chambers (TPCs) for WIMP detection is also being carried out. The intent is to progress to multi-ton detectors with the highest sensitivity for high mass WIMP detection.

### *SHORT BIO*

Laurea in Fisica, Università degli Studi di Cagliari, Cagliari, Italy, December 1970.

M.S. (Physics), The Johns Hopkins University, Baltimore MD, October 1975.

Ph.D. (Physics), The Johns Hopkins University, Baltimore MD, November 1977.

Ensign, Italian Navy, C.A.M.E.N., S. Piero a Grado (Pisa), Italy (1971-72)

Research Associate, Department of Physics; Michigan State University, E. Lansing, Michigan (1978-79 and 1980-81)

Member of Technical Staff, Bell Laboratories; Murray Hill, New Jersey (1979-80)

Assistant Professor, Department of Physics; Florida State University, Tallahassee, FL (1981-85)

Professore Associato, Dipartimento di Fisica, Università degli Studi di Cagliari, Cagliari (1986 - present)

Scientific Attaché Embassy of Italy, Washington D.C (2004 –12)

Currently participating with a team from the University of Cagliari and INFN (Sezione di Cagliari) in the DarkSide Collaboration at INFN Gran Sasso National Laboratory DarkSide has realized the first detector of Dark Matter filled with low-radioactivity underground Argon and built using low-background techniques and materials.

**Moira Di Mauro-Jackson. Ph.D. ---- [md11@txstate.edu](mailto:md11@txstate.edu)**

Department of Modern Languages, Texas State University, San Marcos, TX

Hidden voices: migrants' voices in translation-the use of Italian as portal to the west

Foreign writers have attempted to use Italian as their Lingua Franca throughout the ages. Writers from the Middle Ages, for example, used Italian when seeking to express certain notions, like Love (attempting a Petrarchian Sonnet) or attempting to write in Italian as “outsiders” (as Montaigne, Byron and Pound did later). But in the new immigration advent of the last 20-30 years, we see an Immigration of bilingual authors that chooses to write, inscribe, their original culture in Italian. Italian becomes thus, the language of introduction or passage allowing the eastern mentality to reach the west. Like many contemporary writers, Italian allows these authors to inhabit a space of their own, to inscribe their own identity. These are works in translation, but instead of using the Italian language solely as a communicative device or a literary preference, Italian becomes a condition of being. Dr. Federica Mazzara, a Post-Doctoral Mellon Fellow at University College London (UCL), written in her book ‘Italophone Literature of Migration and Auto-translation: A New Avant-garde in a World Literature Perspective’ discusses the specific dynamics within the Italian cultural, linguistic and literary landscape which condition, but at the same time is also itself modified, by the emergence of these immigrant voices. She stipulates that “Literature of Migration in Italy is a general label that denotes a group of very diverse writers, who only share the choice of writing in Italian – a foreign language for them – as the idiom for literary expression. They have all adopted the Italian language and relate to it in multiple ways according to their personal experiences of migration and their attitudes toward the culture of the “host” country.” One basic assumption of a World Literature perspective is that literary “works gain in translation” (Damrosch, 2003). This paper will therefore explore, if in fact a migrant’s voice translated to Italian allows the world to hear it louder.

*SHORT BIO*

Dr. Di Mauro-Jackson received her PhD at the University of Texas at Austin in Comparative Literature. Her field of study revolves around French, Italian, and English Narrative and Drama of the late 19th and early 20th Centuries. Her field of interest is meta-textuality that is the tension between art and life, art and artifice, and the use of masks and masquerade in modern works. Her major focus lies in the French decadent period, those works following D’Annunzio’s time in Italian Literature as well as various Irish writers of the turn of the century such as Bernard Shaw, Oscar Wilde, and Yeats. Since 1989, Moira, a native Italian, has been teaching French at Texas State University in San Marcos, from where she received her Bachelor and Master of Arts. In 2005, Moira introduced the Italian Language Program at Texas State University and directs a Summer Abroad Program to Italy every summer. Moira has traveled extensively throughout the world and currently divides her time between research and teaching in Central Texas and Italy. Students like her energetic teaching style, and love to hear her stories of when she was an International Student from Italy at Southwest Texas State University.

**Michele Di Pierro MSc., PhD.** ---- [michele.dipierro@utexas.edu](mailto:michele.dipierro@utexas.edu)

Center for Theoretical Biological Physics, Rice University, Houston, Tx

### A Predictive Computational Model For Chromatin Folding

*In vivo*, the human genome folds into a characteristic ensemble of three-dimensional structures. The mechanism driving the folding process remains unknown. We report a theoretical model (**Minimal Chromatin Model**) for chromatin derived by using the maximum entropy principle that explains and predicts the folding of interphase chromosomes. The proposed model allows molecular dynamics simulations of interphase chromatin using as input the classification of loci into chromatin types and the position of loops along the chromosome. MiChroM has been trained to reproduce the Hi-C map of chromosome 10 of human lymphoblastoid cells, and it accurately predicts the Hi-C maps of chromosomes 1-22 for the same cell line. The 3D ensemble resulting from simulations shows unknotted chromosomes, phase separation of chromatin types, and a preference of chromatin of type A, marking actively transcribing genes, to sit at the periphery of the chromosomes.

### *SHORT BIO*

Michele Di Pierro was born in Rome, Italy. He received a M.Sc. degree in Theoretical Physics from the University of Rome La Sapienza in 2008 and a Ph.D. degree in Applied Mathematics and Computational Engineering from University of Texas at Austin in 2014. He is currently the R. A. Welch Postdoctoral Research Fellow in the Center for Theoretical Biological Physics at Rice University in Houston, Tx. He applies statistical mechanics, machine learning and optimization techniques to the study of biological systems. Lately, the focus of his research has been the study of genome architecture.



## **Alberto Di Ronza , PhD ----**

Department of Human and Molecular Genetics, Neurological Research Institute; Baylor College of Medicine, Texas Children Hospital, Houston, TX

### Synergistic heterozygosity in a patient with neurodegeneration and early onset dementia

Neuronal ceroid lipofuscinoses (NCLs) are the most common group of inherited progressive encephalopathies in children. Inheritance is typically recessive, and patients are characterized by lysosomal accumulation of autofluorescent storage material (lipofuscin), progressive loss of vision, mental and motor deterioration and premature death. We screened a set of patients with NCL-like phenotype who were negative to known mutations in NCL genes, and found that two siblings had a frameshift mutation (1005fsinsG-X1066) in *ARSG*, a gene recently associated with NCL in a dog strain. In one patient the disease had a late onset and slow progression, and skin biopsies revealed the presence of lipopigment deposits. The other patient is mildly affected and shows cytoplasmic inclusions in blood buffy coat, psychosis and depression but none of the neuropathological features yet. Surprisingly, we found that both patients also bears a frameshift mutation in *CLN8* (204fsdelC-X376), a gene previously associated with a recessive NCL form. Both mutations in *ARSG* and *CLN8* are heterozygous and lead to the production of truncated and inactive proteins, while the other *ARSG* and *CLN8* alleles are apparently intact and functional, raising the possibility of a condition of synergistic heterozygosity in this patient. The function of *CLN8* is currently unknown while *ARSG* is a lysosomal sulphatase. We found that (i) *ARSG* and *CLN8* proteins interact physically, and (ii) *CLN8* is required for the lysosomal delivery of *ARSG*. When *CLN8* is silenced in HeLa cells, *ARSG* co-staining with lysosomal markers is disrupted in IF analysis, and only an immature, ER-associated form of *ARSG* is found in WB analysis. We found that the localization of two other NCL hydrolases, *PPT1* and *CTSD*, is not affected by *CLN8* silencing, indicating that *CLN8* function may be specific for *ARSG* trafficking. Moreover *CLN8* patients show an accumulation of *ARSG* into the ER and brain protein extracts from *CLN8*<sup>md</sup> mice show an in-vivo 50% reduction of *ARSG* protein, a 50% reduction of enzymatic activity and an overall reduction of *ARSG* immuno-staining in Purkinje cells. We conclude that the patient displays a condition of synergistic heterozygosity in which the sum of the two molecular lesions results in disease. In summary, our study reveals that *CLN8* plays a role in the delivery of *ARSG* to lysosomes, presents the first description of a patient with mutation in *ARSG*, and provides a first case of synergistic heterozygosity in the field of lysosomal storage disorders.

### *SHORT BIO*

Talented and hard-work scientist with an established success in managing and completing challenging research projects. Expert investigator with an extensive theoretical and technical knowledge in molecular genetics and cell biology. He is an experienced lecturer with a strong practice in presenting research findings in national and international meetings. Broad teaching expertise, including teaching molecular biology courses and laboratory techniques to graduate and medical students, postdoctoral fellows and physicians. His leading skills in conducting cutting-edge science projects led him to be co-author in several high-level, peer-reviewed manuscripts. His PhD training was focused on understanding the leading causes of Lysosomal Storage Disorders (LSDs). His studies led to the discovery of the Transcription factor EB

(TFEB), a master regulator of lysosomal biogenesis. He is currently working on the characterization of molecular mechanisms that lead to Neuronal Ceroid Lipofuscinosis (NCL).

**Alberto Falcone, PhD student** ---- [alberto.falcone@dimes.unical.it](mailto:alberto.falcone@dimes.unical.it)

NASA Johnson Space Center Software, Robotics, and Simulation Division (ER);  
Department of Informatics, Modeling, Electronics, and Systems Engineering (DIMES),  
University of Calabria, Rende (CS), Italy

#### Enabling the rapid prototyping of distributed simulations in the space domain

To promote the adoption of distributed simulation practices, standards, and technologies, since 2011, the Simulation Interoperability Standards Organization (SISO), in collaboration with NASA and other research and industrial partners, has been organizing an annual event, named Simulation Exploration Experience (SEE), which involves several U.S. and European Institutions.

In this context, the University of Calabria, working in cooperation with the NASA JSC, developed the SEE HLA Starter Kit to support the implementation of HLA-based simulator (each called a Federate). Specifically, the Kit allows developers to focus on and thus programming the behavior of their SEE Federates without dealing with the common HLA functionalities that are completely managed by the Kit. A first release has been successfully experimented during the 2015 edition of the SEE project by the universities of Calabria (Italy), Bordeaux (France), and Brunel (London, UK). The talk aims at presenting the latest release of the Kit by highlighting the innovative design solutions exploited for dealing with the HLA complexity as well as the lessons learned from the SEE experience. Moreover, the future evolution of the Kit, which will be directed to handle the results coming from the SISO Product Development Group (PDG) dedicated to the standardization of a Space Reference Federation Object Model (SRFOM), is presented.

#### *SHORT BIO*

Alberto Falcone received a Bachelor degree and a M.Sc. degree in Computer Engineering from the University of Calabria(Italy), in 2007 and 2011, respectively. He received a Master title in Industrial Research from the same institution in 2013. He is a PhD student in Information and Communication Engineering at DIMES Department of the University of Calabria. He is currently Visiting Researcher at NASA JSC, working with the Software, Robotics, and Simulation Division. He has been involved since 2014 as a Team Leader in the SEE project.

**Alessandra Ferrajoli, MD ----**

Department of Leukemia, The University of Texas MD Anderson Cancer Center, Houston, TX

Incidence and Prognostic Impact of Other Cancers in a Population of Long-Term Survivors of Chronic Lymphocytic Leukemia

**PURPOSE.** Report on the incidence and the characteristics of other cancers (OC) in patients who live with chronic lymphocytic leukemia (CLL) for many years.

**PATIENTS AND METHODS.** We studied 797 patients with CLL who survived >10 years from the time of initial presentation to our institution. We defined these patients as long-term survivors (LTS) of CLL.

**RESULTS.** Among LTS of CLL, the cumulative frequency of OC was 36% and was similar between the 570 patients (72%) who required treatment for CLL (TRT) and the 227 patients (28%) who remained untreated (UT). The most common OC in both groups was non-melanoma skin cancer (NMSC), followed by prostate cancer, breast cancer, melanoma, lung cancer and leukemia in TRT patients, and by prostate cancer, breast cancer, melanoma, lung cancer and gastrointestinal tumors in the UT group. The standardized incidence ratio (SIR) for all OC was 1.2 (P=0.034). It was higher in males (SIR 1.31; P=0.013) and in patients <60 years (SIR 1.27; P = 0.027). In regards to specific cancer types, a higher SIR was shown for secondary leukemia, melanoma and head and neck cancers, while a lower SIR was found for cancers of digestive tract and bladder. Factors independently associated with the development of OC were advanced age, male gender and lower platelet counts. The survival of patients with OC was significantly shorter than that of patients without OC (16.2 versus 22.9 years, P=0.035).

**CONCLUSION.** Our analysis shows that an increased incidence of OC is present in LTS of CLL as compared to the general population. The presence of an OC in these patients is associated with shorter survival.

*SHORT BIO*

Dr. Ferrajoli is an academic hematologist/oncologist practicing at the University of Texas, MD Anderson since 1998. She was born and raised in Macerata, Italy, and received her medical/academic degree (with honors) from the University of Perugia Medical School in Perugia, Italy in 1988. Her main area of interest includes the treatment and biology of chronic lymphocytic leukemia and its variants, and treatment of elderly patients with all kind of Leukemia. In these fields she has two hundred authored and co-authored many publications in peer reviewed journals. She serves on numerous editorial boards and she is a member of several professional societies such the American Society of Hematology (ASH), the American Society of Clinical Oncology (ASCO), International Society of Geriatric Oncology (SIOG), the European Society for Medical Oncology (ESMO) and the European Hematology Association (EHA). She continues to maintain close collaborations with numerous Universities in Italy and in Europe and regularly hosts and mentors young physicians from these institutions (Universities of Perugia, Milan, Turin, Brescia and Ferrara). She also participates in grant proposal study sessions for several US and European Agencies.

## **Giovanni Filardo, PhD, MPH**

Baylor Scott & White Health, Dallas, TX; Baylor University Medical Center, Dallas, TX; The Heart Hospital Baylor, Plano, TX

**Background:** New-onset postoperative atrial fibrillation (AF) is the most common complication following cardiac surgery and is associated with worse short- and long-term outcomes. There are limited detailed, population-based epidemiological and trends data (timing, duration, number of events, and incidence) available on new-onset AF following coronary artery bypass graft surgery (CABG). The purpose of this NIH-funded study was to rigorously assess the epidemiology AF in 4 high volume cardiac surgery programs. **Methods:** This large multicenter observational study included 11,239 consecutive patients without preoperative AF who underwent isolated CABG between 2002 and 2010 at 4 U.S. academic medical centers. Data routinely collected for the Society of Thoracic Surgeons (STS) database were augmented with a details on AF events abstracted from medical records. **Results:** Table 1 summarizes the patient outcomes following isolated CABG by year, as well as details on the incidence, frequency, timing and duration of new-onset post CABG AF. The STS-risk-adjusted incidence of AF was 33.1% over the 9 years and varied little over time. Unadjusted operative mortality and stroke decreased over time ( $p < 0.001$ ).

**Conclusions:** Our data suggest that ~1/3 of isolated CABG patients develop new-onset AF, and that incidence has remained steady over time despite recent efforts to reduce it. More effective prophylaxis and management is needed, given the impact post-CABG AF is known to have on short- and long-term outcomes.

### *SHORT BIO*

Dr. Filardo is the Director of Epidemiology, Office of the Chief Quality Officer at Baylor Scott & White Health, Dallas, TX; he is The Bradley Family Endowed Chair in Cardiovascular Epidemiology at Baylor University Medical Center, Dallas, TX; and he is the Director of Cardiovascular Epidemiology at The Heart Hospital Baylor, Plano, TX.

Dr. Filardo is an NIH and AHRQ-funded principal investigator. Currently, he is leading a 4-year NHLBI-funded multicenter R01 (1R01HL103683) investigating the effectiveness of prophylaxis and management of new-onset post-CABG Atrial Fibrillation in over 32,000 patients, a large 3-year AHRQ population-based R01 (R01HS018576) studying the effectiveness of open vs endovascular surgery for the management of abdominal aortic aneurysms in over 6,000 patients, and a 2-year industry-funded population-based study investigating ranolazine's potential to prevent short- and long-term re-hospitalizations after cardiac catheterization/percutaneous coronary intervention, and the associated impact on costs of care in over 16,000 patients. As of 2013, Dr. Filardo is also a co-investigator on the NHLBI-funded Baylor Core Clinic Center for the Cardiothoracic Surgical Network (CTSN), which seeks to establish a cooperative network of cardiac surgery programs to promulgate the use of evidence-based medicine in surgical practice. Dr. Filardo is the Director of Epidemiology within the Baylor Scott & White Health Office of the Chief Quality Officer, the Bradley Family Endowed Chair in Cardiovascular Epidemiology at Baylor University Medical Center, and the Director of Cardiovascular Epidemiology at the Heart Hospital Baylor Plano. He leads over 20 research projects, the majority involving multiple

sites/centers, including 3 randomized trials. He has published over 100 manuscripts and presented his research results at more than 30 conferences. Dr. Filardo's research predominantly focuses on outcomes of cardiac surgery. Dr. Filardo also serves as a Research Associate Professor of Statistics II at Southern Methodist University, Adjunct Professor of Medicine at University of Louisville, KY, and Adjunct Associate Professor of Epidemiology at the University of North Texas, Fort Worth, TX. Dr. Filardo received his PhD in Epidemiology with a concentration in cardiovascular disease from Yale University and has worked with several world leaders in cardiothoracic surgery, cardiology, and epidemiology, including Dr. Alessandro Liberati at the Italian Cochrane Center, Dr. Ballard at Emory University and at Baylor, Dr. Harlan Krumholz at Yale University, Drs. Paul Grayburn, and William Roberts at Baylor University Medical Center and the Baylor Heart Hospital, Dr. Clyde Yancy at Northwestern University, and Drs. Shahian, Damiano, and Mack at Massachusetts General Hospital, Washington University, and Baylor, respectively. Dr. Filardo has a strong record of research pertaining to the quality and safety of medical care and has conducted key research into understanding the patterns of care and patient outcomes in cardiovascular disease, particularly with respect to patients undergoing cardiac surgery. In 2006, his work in the field of cardiothoracic surgery risk model development led to an invitation to serve as an associate member of the STS Quality Measurement Task Force responsible for developing mortality and morbidity models for the STS Workforce. Dr. Filardo also serves on the American Journal of Cardiology Editorial Board as an Associate Editor.

**Daniele Filippetto, PhD.** ---- [dfilippetto@lbl.gov](mailto:dfilippetto@lbl.gov)

Accelerator Technology & Applied Physics Division; Lawrence Berkeley National Laboratory, Berkeley, CA

### Ultrafast and Ultrasmall: The secret lives of particle accelerators.

Particle accelerators are an incredibly powerful source of inspiration. Since their early appearance about 90 years ago, they have found direct applications spanning almost all area of human interest, from health to food, from pure science to national security. Reasearchers use them as discovery tools, to duplicate and revive the early stages of our Universe, and probing the intimate structure of Nature. At Lawrence Berkeley National Lab, we are making use of the latest accelerator technology for developing the next generation of electron microscopes, that will be able to take consecutive snapshots of moving atoms, at time intervals of the order of 100 femtosecond ( $10^{-13}$  s). Thanks to such fast “shutter” we will be able to film “molecular movies”, witnessing the crucial moments in the making and breaking of chemical bonds, following reaction pathways and structural/conformational changes during phase transformations, and shining a light on the processes at the basis of life, understanding and ultimately mimicking Nature.

### *SHORT BIO*



Daniele is a Physicist Research Scientist at Lawrence Berkeley National Laboratory. He graduated in Electronic Engineering and obtained his PhD in theoretical and applied electromagnetism at the university of Rome “La Sapienza” in Italy, in 2007.

For the following 3 years he worked at the National Institute for Nuclear Physics (INFN), in Frascati, on the development of a new instrument for the generation of coherent high-energy photons, the *Free Electron Laser*.

In 2010 he moved to Berkeley, conitnuing his research in the context of electron and photon sources for discovery science.

In 2014 He was awarded by the Departent of Energy-Basic Energy Science (DOE-BES) with the Early Career Award, and he and his group are now working on the development of a new ultrafast electron diffractometer.

**Cesare Fracassi, PhD, MBA ---- [cesare.fracassi@mcombs.utexas.edu](mailto:cesare.fracassi@mcombs.utexas.edu)**

Department of Finance, McCombs School of Business, University of Texas at Austin, Austin, TX,

Over the past decade, the financial service industry has been undergoing a rapid transformation due to recent innovation in information technology. Such change is disrupting the industry across the entire spectrum of financial products, from banking to mobile payment, peer-to-peer lending, crypto-currencies, wealth management, and algo-trading. Global investments in the area of financial technology tripled to \$12Bn in 2014, and new businesses are started every day to improve access to finance and to provide cheaper, more targeted services to individuals and corporations. The presentation will introduce the audience to this fast-growing and exciting intersection between technology and finance, labeled FinTech, and illustrate the opportunities and challenges ahead for the financial services industry.

#### *SHORT BIO*

Cesare joined the Finance Faculty at the McCombs School of Business in 2009. His primary research interest is in the area of corporate finance. His research includes work on corporate governance, executive compensation, credit rating agencies, small business financing, and the effects of social networks and cultural preferences on financial policies. His articles have been published in the top Finance journals, such as the Journal of Finance, the Journal of Financial Economics, the Journal of Financial and Quantitative Analysis, and Management Science. He teaches corporate finance and valuations in the MBA program, and empirical corporate finance to PhD students. Cesare holds a Bachelor's degree in Electrical Engineering from the Politecnico di Milano (Italy), and an MBA and PhD in Finance from UCLA Anderson. He was a visiting professor at the Wharton School in 2012/2013. Before his PhD, he worked as strategic management consultant at Booz Allen and Roland Berger in Italy, and as summer intern at the United Nations in New York.



## **Alberto Fucarino, MS**

Istituto Euro-Mediterraneo di Scienza e Tecnologia (IEMEST), Palermo, Italy

### Three-Dimensional culture of bronchial mucosa in microgravity: a new model to study respiratory cell differentiation and stress during SPACE-flight.

Alberto Fucarino<sup>1</sup>, Francesco Cappello<sup>1,2</sup>, Donna E. Davies<sup>3</sup>, Pieter Hiemstra<sup>4</sup>, Cristiana Rastellini<sup>5</sup>, Fabio Bucchieri<sup>1,2</sup>

<sup>1</sup>Istituto Euro-Mediterraneo di Scienza e Tecnologia (IEMEST), Palermo, Italy; <sup>2</sup>Department of Experimental Biomedicine and Clinic Neurosciences, University of Palermo, Palermo, Italy; <sup>3</sup>Southampton National Institute for Health Research (NIHR) Respiratory Biomedical Research Unit, Sir Henry Wellcome Laboratories, University of Southampton Faculty of Medicine, University Hospital Southampton, Southampton, United Kingdom; <sup>4</sup>Department of Pulmonology, Leiden University Medical Center, Leiden, The Netherlands; <sup>5</sup>University of Texas Medical Branch, Galveston, Texas, United States.

A new 3D model of the human bronchial mucosa will be used to study, on board the International Space Station (ISS), the changes occurring in airways exposed to the extreme environmental conditions found in Space. The bronchial outgrowth offers numerous advantages compared to traditional approaches that use human tissue, including: the morphological analogy with the bronchial mucosa; the possibility to study long-term exposure to different environmental factors, through the opportunity to analyze eventual modifications in the long term; the possibility to add cellular and humoral components of the immune system to the culture in order to evaluate their effects. Our application to the ILSRA 2014 solicitation by NASA/ESA, in which we propose to study the effects of prolonged stay on board the ISS on the development and function of human airway cells in our model, was successful and our project was selected for the following phases, including application on the ISS. This project will involve several international partners, including, in addition to the University of Palermo and Southampton, the Euro-Mediterranean Institute of Science and Technology (IEMEST, Palermo), the University of Leiden (NL), the University of Galveston (Texas, USA), the Wyle Laboratories (Texas, USA) and NASA itself. The results obtained will be particularly useful in view of exploratory missions of our solar system planned in the near future. Our latest experiments have focused on testing the resilience of the model in the extreme environmental conditions present on board the vectors that transport the samples to the ISS, such as lower temperature (10°C and 20°C), or CO<sub>2</sub> concentration change. The results obtained showed that the model is able to promptly recover its original structure and function despite any initial damage that may occur due to adverse conditions during transport.

Acknowledgements: We would like to express our gratitude to Eng. Orazio Chiarenza for his support in establishing the connections with the scientists at the Johnson Space Center of the National Aeronautics and Space Administration, Houston, TX, USA.



### *SHORT BIO*

Alberto Fucarino 05/02/1984, Italian Master's Degree in Medical Biotechnology and Molecular Medicine (110/110 Cum Laude) International Internship at the Leiden Medical University Center, Dept. Of Pulmonology Under the supervision of Professor Pieter Hiemstra Ph.D. in Molecular and Experimental Medicine PostDoc Internship with active work in tissue bio-engineering at the Department of Experimental Biomedicine and Clinical Neurosciences, Palermo, Italy

**Roberto Furfaro, PhD** ---- [robertof@orex.lpl.arizona.edu](mailto:robertof@orex.lpl.arizona.edu); [robertof@email.arizona.edu](mailto:robertof@email.arizona.edu)

Department of Systems and Industrial Engineering, Department of Aerospace and Mechanical Engineering, The University of Arizona, Tucson, AZ

From NASA OSIRIS-REx Asteroid Sample Return Mission to Mars-Lunar Greenhouse Research: Overview of the UA Space Systems Engineering Laboratory

University of Arizona (UA) Space Systems Engineering Lab (SSEL) was founded in 2010 with the goal of developing in-house engineering capabilities to support current and next generation of UA Lunar and Planetary Laboratory (LPL) missions for the robotic exploration of the solar system. Such capabilities include mission analysis and design studies, preliminary spacecraft design, systems engineering methodologies and algorithms for data analysis. Additionally SSEL personnel actively conducts research on a variety of subjects including remote sensing data analysis, intelligent exploration of the solar systems, space situational awareness, machine learning applications to space problems, non-linear guidance algorithms and Bioregenerative Life Support Systems (BLSS) research. In this talk, we will briefly highlight two of the major projects currently on-going at SSEL, i.e. NASA OSIRIS REx and Mars-Lunar Greenhouse (M-LGH). In May 2011, NASA selected OSIRIS REx as the next New Frontiers mission to be flown in space. Proposed and led by University of Arizona (PI: Dr. Dante Lauretta UA/LPL) in partnership with NASA Goddard, Lockheed Martin and KinetX, the team will launch the spacecraft in September 2016 to collect a sample material (>60 grams) from the asteroid Bennu (formerly 1999 RQ36) and return it safely to Earth by 2023. In this talk, we will give an overview of the mission and the role of SSEL personnel within the mission. As part of future Lunar and Mars outposts, BLSS technologies are conceived to employ crop production to revitalize the habitat atmosphere, recycle the crew water, and generate a portion of the crew's total caloric intake that will greatly reduce resupply requirements. In this talk, we will provide an overview of the current NASA-funded, 4-units M-LGH prototype for BLSS research.

*SHORT BIO*

Prof. Roberto Furfaro is currently an Assistant Professor at the Department of Systems and Industrial Engineering, and Department of Aerospace and Mechanical Engineering, University of Arizona. In 1998, he graduated with a Laurea degree in Aeronautical Engineering from University of Rome. In 2004, he obtained a PhD in Aerospace Engineering from University of Arizona. In 2010, he founded the UA Space Systems Engineering Lab which he currently directs. His research interests include guidance and control of space systems, intelligent algorithms for space exploration, space situational awareness, machine learning applications to space, remote sensing of planetary bodies as well as model-based systems engineering as applied to space missions. Prof. Furfaro is currently the interface between the Science and Processing Operation Center (SPOC) and the Science team of the NASA OSIRIS REx Asteroid Sample Return Mission and led the systems engineering team for the mission science data processing and operations. Since the beginning of 2013, Prof. Furfaro has been appointed as technical member of the American Astronautical Society Spaceflight Mechanics Committee.

**Alfredo Garro, PhD** ---- [alfredo.garro@unical.it](mailto:alfredo.garro@unical.it)

NASA Johnson Space Center Software, Robotics, and Simulation Division (ER);  
Department of Informatics, Modeling, Electronics, and Systems Engineering (DIMES),  
University of Calabria, Rende (CS), Italy

#### *SHORT BIO*

Alfredo Garro is an Associate Professor of Computing Systems at the DIMES Department of the University of Calabria(Italy). He is currently Visiting Professor at NASA JSC, working with the Software, Robotics, and Simulation Division. He received a Laurea degree in Computer Engineering and a Ph.D. degree in Systems and Computer Engineering from the University of Calabria, in 2000 and 2005, respectively. His research activity is documented by about 100 scientific papers. He is vice chair of the SRFOM-PDG of SISO. He is the Technical Director of the “Italian Chapter” of the International Council on Systems Engineering. He is Technical Leader in the Open Source Modelica Consortium. He is a member of the Executive Committee and National Coordinator for Italy in the MODRIO European Project. He is a Member of the CINI National Lab on Cyber Security and the related Technological District.

**Giacomo Ghiraldo, MBA**

International Accelerator, Austin, TX

The U.S. has seen the importance of attracting highly-skilled international professionals and, in particular, an emerging importance of immigrant founders. This is due especially to their huge contribution to the economy. Unfortunately, major setbacks are holding these talented individuals from founding successful businesses in the US. International Accelerator's 6 to 12 months Program makes IA the launch pad and ongoing partner for global founders. IA is an Austin-based startup Accelerator focusing solely on immigrant founders seeking access to U.S. markets and funding.

***SHORT BIO***

Giacomo Ghiraldo, 25 years old, is working as Country Advisor Manager at International Accelerator in Austin, TX. Giacomo joined IA in 2015 and he had previous experiences working as Analyst at H-FARM Ventures, and as Business Development Consultant at SV Links, NGO based in Palo Alto, CA. Giacomo earned his MSc Degree in Business Administration at University of Padua in 2014, with a thesis on technology transfers business models and performance indicators. He was awarded with the EDEN Project Scholarship at Recant Business School, Tel Aviv University in 2013.

**Alberto Giordano, Ph.D. ---- [ag22@txstate.edu](mailto:ag22@txstate.edu)**

Department of Geography, Texas State University, San Marcos, TX

### Geography of the Holocaust in Italy

On September 8, 1943, Nazi German forces occupied Italy, signaling the beginning of the Holocaust in Italy. Between September 1943 and March 1945, some 10,000 Jews were deported from Italy to Nazi concentration and extermination camps. The vast majority of them perished, principally at Auschwitz. This presentation examines the Holocaust in Italy using the tools and methods of Geographic Information Science. It focuses on one specific stage of the Italian Holocaust, the arrest stage, with the goal of identifying and analyzing spatio-temporal patterns in the arrest, transportation, and, ultimately, deportation of Jews from Italy to Germany and Eastern Europe. The starting point for this work is the creation of an historical GIS of the Holocaust in Italy, which includes demographic information on about 9000 victims (e.g., name, place and date of birth), information about places and events (e.g., place and date of arrest), and information about the nationality of the perpetrators (German vs. Italian). The next stage involves the utilization of spatio-temporal analytical methods to search for patterns in victims' trajectories, from their place of residence, to places of detention in Italy, to deportation to labor and extermination camps outside of the country. The analysis revealed significant regional differences in the patterns of arrest in places and at times where police actions were chiefly under German versus Italian control. It also revealed that spatio-temporal patterns of arrest varied by gender and age. It thus demonstrates the importance of geography in understanding and explaining perpetrators' actions and victims' trajectories during the Holocaust. The results of this work are published in a coedited book on the Geographies of the Holocaust.

### *SHORT BIO*

Dr. Alberto Giordano is Professor and Chair in the Department of Geography at Texas State University. His research focus is on the geography of genocide and the Holocaust, Historical GIS, and spatial forensics. His publications include a coauthored book (in Italian) on geographic data quality, an edited book on the Geographies of the Holocaust, and several journal articles and book chapters. He has served in the editorial office of the National Atlas of Italy, collaborated with volume 6 of the History of Cartography Project, and served in the editorial board of Rand McNally's Goode's World Atlas. Most recently, Dr. Giordano has been awarded grants and research funding from the National Science Foundation, the Holocaust Educational Foundation, the United States Holocaust Memorial Museum, the Shoah Foundation, and the European Holocaust Research Infrastructure, among others. He has been Co-Chair of the Historical Geography Network for the Social Science History Association and a Member of the International Cartographic Association commissions on Maps and the Internet and on Spatial Data Quality. He is on the board of the newly established National Center for Research in Geography Education (NCRGE), a joint initiative of Texas State University and the Association of American Geographers (AAG).

**Riccardo Giumelli** ---- [riccardo.giumelli@univr.it](mailto:riccardo.giumelli@univr.it)

Dipartimento Culture e Civiltà, Area Arti, Letteratura e Comunicazione, Università di Verona,  
Italy

### In time of glocalisation: which meaning for the Made in Italy

We are experiencing a deeply change of age. As many important sociologists said we are facing a change of our identity and our social relations in everyday life. Time and space are changing, proximity is our local dimension, but we are immersed in the global flows. Deterritorialization is a widespread characteristic of this new era, deeply different from the modern era, where the territory was so linked to sovereignty and citizenship. Nowadays the crisis of the idea of modern state nation is reflected by the difficulty to keeping the same meanings to the same expressions. This creates consequences for the Italian community in the world and their changes, the fundamental theme of our research, which take on new identities and functions. We use to say "Made in" China, or Italy, or France to express the idea that some products are manufactured in a particular country. In particular, the case of Made in Italy shows how globalisation and glocalisation are changing the traditional way of production, creating goods whom identity become transnational. Is this a real and appropriated meaning respect to the global flux of goods, expertise, knowledge? Delocalization and new processes of "back-reshoring" (part of the production comes back in the original country) cut the relations between, for exemple, products and territory. The problem is understanding the belonging and, on the other face, the identity of goods, services, intellectual propriety, and so on. Our goal is to identify a new paradigm where the preposition "in" could be combined with "by". The implicit idea is to move from a paradigm of the modern era with the state nations as protagonists to a new one more and more with cultural and glocal social actors. For better understanding what I mean I will present different cases of analysis related to the concept of Made in Italy and the new phenomenon of the Italian sounding. It will be analyzed the role of Italian Chambers Of Commerce abroad, Com.It.Es and Regional Association in the world. Our reflection moves from a research begins in 2013, at the University of Verona joint with the Italian Chamber of Commerce in Caracas, Venezuela and the project Italicos.

### *SHORT BIO*

Riccardo Giumelli is a sociologist, researcher at the University of Verona, where he teaches Sociology of Cultural Processes. He also taught for many years at the University of Florence and Trento. He is columnist for the online newspaper "La Voce di New York". He has published books and articles for italian and international journals.

Dennis Kunichoff---University of Houston graduate (dkunichoff@gmail.com)

### Crisis and the University: Responses to the Real World

This panel discusses UH faculty and student responses to the current refugee crisis in Europe as an example of the new synergy between research and service-learning. Richard Armstrong will introduce his co-presenters, and Prof. Carl Lindahl, whose work on disaster-victim and refugee narratives has found new therapeutic benefits, and Pietro Cicalese and Dennis Kunichoff the students co-founders of the Global Humanitarian Student Initiative (GHSI), who are focusing their student-led efforts to aiding migrants currently housed in Sicily. Prof. Lindahl will detail his collaboration with colleagues in Palermo and Bologna in developing his new Who We Are project, which focuses in particular on migrants in Italy and Scandinavia. Pietro Cicalese's experiences in humanitarian service organizations inspired him to create this group, emphasizing the student's role in the planning and execution of service projects. He believes that students have the capacity and will power to manage and maintain service projects without having to rely on third party entities, which require additional monetary investment. He understood this when he travelled to Haiti with the student group called Friends of Haiti (FOH), where he played a powerful role alongside other students to provide quality healthcare with the help of medical professionals. This experience drove him to undergo other projects with GHSI, including a service trip to the island of Sicily in the summer of 2016 to help the migrant and refugee populations that are found there.

### SHORT BIO

Dennis Kunichoff, born in Houston to Moldovan parents, had the privilege to live around the world and spend his formative years in The Hague, The Netherlands. He attributes a great deal of his outlook and drive to the experiences he had overseas. As a recent UH graduate awarded two B.S. degrees in Biology and Psychology, he now focuses his time to applying to medical schools, developing GHSI, and working in pediatric nutrition research at Baylor College of Medicine. His first medical service trip to Haiti, in the summer of 2015, revealed to him the degree of impact a group of dedicated students can have on a community in need and since then he has strongly advocated for the importance of student empowerment in providing community service. Dennis' enjoys reading, playing chess, and a good, thoughtful discussion. He has high aspirations for GHSI and plans to have a major role in seeing them through.



## **Fred Kuwornu**

Film Director

### 18 Ius Soli

Director Fred Kuwornu's documentary 18 Ius soli in Italy features an important problem linked to Immigration in Italy where almost a million young men and women were born to or raised by immigrant parents, and 12.6% of babies born in the country have non-Italian parents. Unlike most neighboring countries and the US, these men and women are denied the right to acquire Italian citizenship by the Ius soli law, which results in 42% of them remaining aliens when they turn 18 (the age of maturity in the EU). The documentary explores this problem and it is a very good gateway to discussions about the challenges and opportunities of a global society.

### *SHORT BIO*

Fred Kudjo Kuwornu, born and raised in Italy, is an Italian-Ghanaian activist, producer, writer, and director based in Brooklyn, NY and Rome. In 2010, after working with the production crew of Spike Lee's *Miracle at St. Anna* (2008), he produced and directed the award-winning documentary *Inside Buffalo*, followed in 2011 by *18 Ius Soli*. Kuwornu founded the non-profit organization *Diversity Italia*, promoting the importance of racial and ethnic diversity in Europe, using film and other arts as tools for building a more inclusive society. His current projects are *Blaxploitalian* about Blackness in Italian cinema, *Afropeans* about the Black diaspora in Europe, and *65* about the 50th Anniversary of the Voting Act.

**Carl Lindahl, PhD. ---- [lindhalcarl1@gmail.com](mailto:lindhalcarl1@gmail.com)**

University of Houston, Houston, TX

### Crisis and the University: Responses to the Real World

This panel discusses UH faculty and student responses to the current refugee crisis in Europe as an example of the new synergy between research and service-learning. Richard Armstrong will introduce his co-presenters, and Prof. Carl Lindahl, whose work on disaster-victim and refugee narratives has found new therapeutic benefits, and Pietro Cicalese and Dennis Kunichoff the students co-founders of the Global Humanitarian Student Initiative (GHSI), who are focusing their student-led efforts to aiding migrants currently housed in Sicily. Prof. Lindahl will detail his collaboration with colleagues in Palermo and Bologna in developing his new Who We Are project, which focuses in particular on migrants in Italy and Scandinavia. Pietro Cicalese's experiences in humanitarian service organizations inspired him to create this group, emphasizing the student's role in the planning and execution of service projects. He believes that students have the capacity and will power to manage and maintain service projects without having to rely on third party entities, which require additional monetary investment. He understood this when he travelled to Haiti with the student group called Friends of Haiti (FOH), where he played a powerful role alongside other students to provide quality healthcare with the help of medical professionals. This experience drove him to undergo other projects with GHSI, including a service trip to the island of Sicily in the summer of 2016 to help the migrant and refugee populations that are found there.

### *SHORT BIO*

Carl Lindahl is a UH Professor and a Fellow of the American Folklore Society, a Fulbright Distinguished Scholar, a Folklore Fellow of the Finnish Academy of Sciences, and an internationally recognized authority in folk narrative, medieval folklore, folktales and legends, festivals and celebrations, folklore fieldwork, traditional healing strategies, and ways in which folk cultures seek and exercise covert power. Among the folk cultures he has explored are French Americans (Cajun, Creole, and Caribbean) and the regional cultures of Texas, Appalachia, and the Ozarks Lindahl's *Swapping Stories: Folktales from Louisiana* (1997) was named the Louisiana Humanities Book of the Year by the Louisiana Endowment for the Humanities. He has received the Alcée Fortier Award from the American Folklore society, and has won a University of Houston Teaching Excellence Award. Among his books are *Cajun Mardi Gras Masks* (1997), *American Folktales from the Collections of the Library of Congress* (2004), and *Second Line Rescue: Improvised Responses to Katrina and Rita* (2013). He currently serves on the editorial boards of *Fabula: Journal of Folktale Studies* (Göttingen, Germany) and *Folk Life* (Belfast, Northern Ireland) as well as the advisory board of the Folklife and Traditional Arts program of Houston Arts Alliance. In 2005 he founded *Surviving Katrina and Rita in Houston [SKRH]*, the world's first project in which disaster survivors have taken the lead in documenting fellow survivors' experience of disaster. He continues to co-direct SKRH, which has received worldwide recognition for its role in aiding survivors overcome the traumatic effects of hurricanes. In 2014 he convened a Rockefeller Foundation Bellagio Conference bringing together ethnographers, disaster survivors, and public health specialists from seven countries to

strategize ways in which to help survivors draw upon their traditional knowledge to become more active agents in their own recovery. The conference culminated with the formation of the International Commission for Survivor-Centered Disaster Recovery, of which he is the founding organizer. Also in 2014 he began working with Haitians to create Sivivan pou Sivivan (Survivor to Survivor), a pilot program based on the model of SKRH, in which Haitian earthquake survivors interview one another. Lindahl is working to make Sivivan pou Sivivan a self-sustaining, entirely Haitian-run and Haitian-staffed program.

## **Filippa Lo Cascio, PhD student**

Mitchell Center for Neurodegenerative Diseases, Departments of Neurology, Neuroscience and Cell Biology, University of Texas Medical Branch, Galveston, TX

### Small Molecules that Modulate Toxic Tau Oligomeric Strains

Filippa Lo Cascio<sup>1,2,3</sup>, Julia Gerson<sup>1,2</sup>, Urmi Sengupta<sup>1,2</sup>, Francesco Cappello<sup>3,4</sup>, Claudia Campanella<sup>3,4</sup>, Celeste Caruso Bavisotto<sup>3,4</sup>, Rakez Kaye<sup>1,2</sup>

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<sup>2</sup>Departments of Neurology, Neuroscience and Cell Biology, University of Texas Medical Branch, Galveston, TX, 77555, USA;

<sup>3</sup>Department of Experimental Biomedicine and Clinical Neurosciences, University of Palermo, Palermo, Italy; <sup>4</sup>Euro-Mediterranean Institute of Science and Technology, Palermo, Italy

Age-related neurodegenerative disorders are the leading cause of death and disability in the elderly population. As life expectancy increases and therefore, the amount of people living with neurodegenerative diseases rise, finding an effective prevention and treatment strategy becomes increasingly important.

The aggregation and accumulation of the misfolded microtubule-associated protein, Tau, is a pathological hallmark of Alzheimer's disease (AD) and many other neurodegenerative disorders. For many years, neurofibrillary tangles (NFTs), which are aggregates of [hyperphosphorylated Tau protein](#), have been assumed to be the cause of neuronal toxicity since they correlate very well with cognitive decline and neuronal loss.

Recent studies by our lab that have been confirmed by others demonstrate that the true toxic and propagating species in these diseases are tau oligomeric structures, aggregates of a size intermediate between monomers and NFTs.

Tau oligomers are a heterogeneous group of biophysically and conformationally distinct tau multimers that manifest in numerous conformations termed tau oligomeric strains. Due to the dynamic nature of these strains, studies focusing on the mechanisms underlying their formation and characteristics are challenging. Thus, depleting the disease-relevant structures using small molecules could be a powerful therapeutic strategy that targets toxicity regardless of the diverse factors involved in the formation of tau oligomeric strains. Herein, we will use novel biochemical, biophysical and immunohistochemical screening to identify small molecules targeting and binding specifically tau oligomeric strains associated with different neurodegenerative tauopathies and neutralize their toxicity and/or formation.

### *SHORT BIO*

Filippa graduated in Pharmaceutical Chemistry and Technology at the University of Palermo in 2013 presenting the experimental thesis "3-benzoyl-5aminobenzofuran derivatives: new inhibitors of Hsp60 in targeted therapy approach". She is currently a PhD student in the Neuroscience PhD Program of University of Texas Medical Branch and University of Palermo. This is the first international PhD program between

the state of Texas (USA) and the University of Palermo (Italy). She is currently conducting her research in the department of Neurology of Neuroscience and Cell Biology at the University of Texas Medical Branch under the mentorship of Drs. Rakez Kaye, Fabio Bucchieri and Antonino Lauria.

**Simone Lolli, PhD** ---- [simone.lolli@nasa.gov](mailto:simone.lolli@nasa.gov)

NASA Goddard Space Flight Center, Greenbelt, MD

Cirrus Cloud Radiative Characteristics from Continuous PLNET Profiling at GSFC in 2012

S. Lolli<sup>1\*</sup>, J. R. Lewis<sup>1</sup>, J. R. Campbell<sup>2</sup>, E. J. Welton<sup>3</sup>, Y. Gu<sup>4</sup>

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Optically thin cirrus cloud (optical depth  $< 0.03$ ) net radiative effect represents one of the primary uncertainties in climate feedback, as sub-visible clouds play a fundamental role in atmospheric radiation balance and climate change. A lidar is a very sensitive optical device to detect clouds with an optical depth as low as  $10^{-4}$ . In this paper we assess the daytime net radiative effect of sub-visible cirrus clouds detected at Goddard Space Flight Center, a permanent observational site of the NASA Micro Pulse Lidar Network in 2012. Depending on their height, season and hour of the day, the solar albedo effect can outweigh the infrared greenhouse effect, cooling the earth-atmosphere system rather than warming it exclusively. As result, based on latitude, the net effect of sub-visible cirrus clouds can be more accurately parameterized in climate models.

**SHORT BIO**

Soimone Lolli, Ph.D, Assistant Research Scientist at NASA Goddard Space Flight Center

**Angela Lombardi, PhD** ---- [Angela.Lombardi@utsa.edu](mailto:Angela.Lombardi@utsa.edu)

Department of Architecture, Construction and Planning, University of Texas at San Antonio, San Antonio, Texas

Texas Classicism: an analysis of Renzo Piano's architectural works in the Lone Star State.

Every period of history has created a different idea of 'classical' focused at reinforcing its own identity and at creating an effective foundations for new trends. 'Classical, in this way, does not concern only the past, but involves the present, and moreover offers a vision toward the future.

This paper discusses how classical principles and approaches are used in contemporary architectural design, in particular in three architectural works designed by Renzo Piano Building Workshop and built in three Texas cities: the expansion of the Kimbell Museum in Fort Worth (2013), masterpiece of Louis Kahn, the Menil Museum in Houston (1987) and the Nasher Sculpture Center in Dallas (2003).

Piano's architecture in his early experimental practice is dominated by a strong fascination for advanced technological solutions, which remains a consistent leitmotiv in all his architectural works: In Texas buildings, the architect embraces Vitruvian principles of *ordinatio*, *dispositio*, *symmetria* and *eurithmia*, for the creation of contemporary masterworks. It is also outstanding the architect's careful attention to scale, orientation, materiality, and programmatic layout which all adhere to the surrounding context without disrupting any of the preexisting conditions. For the Italian architect, the historical and environmental context are paramount in the consideration of the final design.

The adopted architectural vocabulary - giving form to buildings' spaces - is the product of his cultural background: load-bearing walls – reminding the typically European architecture of stone; porticos - wrapping the building, creating a tectonic understanding of the structure; the human scale spaces, both indoor and outdoor, echoing the memory of Italian Piazzas, and; the Italian gardens archetypes where nature and art together create the perfect environment for fulfillment.

In the Lone Star state, Piano's buildings are far from spectacle, but rather more supplementary to an already established neighborhood scale and in sensitive relationship with existing structures.

In the most recent project, the expansion of the Louis Kahn Kimbell museum, Piano engages a multi-level dialogue between the Kahn's Roman tectonic and his new pavilion trabeated frame. His approach reminds the one undertaken centuries ago by Antonio da Sangallo de Elder with Brunelleschi's *Ospedale degli Innocenti*, stating that even today architecture is Humanism.

## SHORT BIO

Dr. Lombardi, architect, is Assistant Professor in the College of Architecture, Construction and Planning, University of Texas at San Antonio. She focuses her internationally based research on the management of built heritage. Editor of the book: LIMA, *Historic Center. Analysis and Restoration* (2012), she is currently investigating the cultural landscape of San Antonio, Texas, recently nominated World Heritage Site; material conservation of Spanish Colonial Structures, and; sustainable adaptive reuse and design in historic contexts. She worked on the material conservation of Cathedral of Siena, Cathedral of Pienza, and, after working in 2010 in the Middle East region, at the archaeological sites of Baalbek and Tyre in Lebanon, in 2013 and 2014 she was UTSA instructor for the Archaeological Site Management Workshop held in Erbil, Iraq, dedicated to Iraqi professionals, organized by WMF and sponsored by US Department of State. She holds a March, a MS and a PhD in Architectural Conservation from Sapienza University of Rome, Italy.



**Federico Lorenzo PhD. --- [LFederico@mdanderson.org](mailto:LFederico@mdanderson.org)**

System Biology, The University of Texas MD Anderson Cancer Center, Houston, TX

A heterogeneous murine syngeneic transplantation model for breast cancer precision medicine

We have previously demonstrated that altered production and activity of the bioactive lipid lysophosphatidic acid (LPA) in mammary glands creates a tumorigenic environment. Using this model, we have established a series of mouse-derived syngeneic transplants (MDST) to study neoplastic disease in an immunocompetent and pathophysiologically relevant context. Longitudinal and multiregional resampling of tumor transplants coupled to molecular and phenotypic characterization showed that each graft retains the macroscopic and molecular identity of the original tumor irrespectively of the number of transplant generations. A subgroup of slow-growing, E-cadherin (CDH1)-positive, mammary gland carcinomas was characterized by significant inter-tumor heterogeneity and a wide range of tumor-specific molecular alterations similar to human breast cancers. Strikingly, targeting PARP1 and MAPK pathways demonstrated drug sensitivity to be dependent on alterations of the targeted molecule. Our results demonstrate that the MDST model represents a robust experimental platform that can be used as a tool for discovery of new molecular targets and assessment of targeted therapies.

*SHORT BIO*

My primary research focuses on the study of the mechanisms that promote cancer formation and progression. I am currently using preclinical cancer models in combination with pharmacological screenings, classic molecular and biochemical techniques, high-throughput technologies, and metabolic analyses to identify specific vulnerabilities of breast and ovarian cancers. The goal of my research is to help guiding the development of selective pharmacological therapies in the context of a personalize medicine approach, where patients are individually treated according to the molecular characteristics of their tumor.

**Simone Lucatello, PhD, MS** ---- [slucatello@institutomora.edu.mx](mailto:slucatello@institutomora.edu.mx)

Instituto Mora, Mexico City, Mexico

### Risk Management and climate change in Latin America: the case of Mexico

Mexico has a sound record for addressing climate change and environmental challenges and is considered a global leader in this field. Starting with natural hazards, with more than 90 earthquakes a year with a magnitude of 4.0 or more on the Richter scale, Mexico is one of the world's most exposed countries to a large variety of geological and hydro-meteorological phenomena. It is yearly hit by hurricanes both from the Pacific and the Atlantic Ocean and around two-fifths of Mexico's territory and over a quarter of its population are exposed to storms, hurricanes, and floods (FONDEN:2015)

Mexico stands at the forefront of global initiatives to develop comprehensive disaster risk management structures and programs, including interesting disaster risk finance and insurance strategies to manage the fiscal risk posed by disasters and climate change impacts. Driven partly by the country's vulnerability to climate impacts and permanent risks, the Mexican Government has committed to a long term strategy plan to address climate change through the adoption of a wide range number of policies, spanning from disaster risk management to active role in global negotiations. However, environmental and climate governance still represent a strong challenge to the country, given the poor conditions of most of the Mexican rural and urban communities. In particular, the indigenous groups, still depend on natural resources of income threatened by the effects of disasters and climate change impacts.

### *SHORT BIO*

Full time researcher at the Research Institute Dr. Jose Maria Luis Mora, a Mexican public research center belonging to the Mexican National Council for Science and Technology (CONACYT). He holds a BA in political science from the University of Venice Italy and from the University College London (UCL) and a Master Degree in International relations from the London School of Economics and Political Science (LSE) UK. He also holds a PhD in Analysis and Governance of Sustainable Development from the Venice International University (VIU), Italy. His research interests deal with climate change, sustainability, international cooperation and the environment, humanitarian aid and disasters. He is also a fellow of the Research Program on Climate Change at UNAM and member of social scientific committee of the National System of Civil Protection (NSCP) CENAPRED (National Center for Disaster Prevention) of the Mexican Ministry of the Interior.

He served as consultant to several United Nations agencies (UNEP, UNIDO, ECLAC), the Inter-American Development Bank, the European Union (Europe Aid) in the Balkans, Central America, Caribbean and Mexico. He has also collaborated with the Development Planning Unit (DPU) of University College London (UCL), England and the University of Bergen, Norway and he was a fellow researcher at the UNEP-DTU partnership for climate change in Denmark. His most recent book is titled "*Gobernanza de los recursos naturales en América del Norte*) Governance of natural resources in North America," published jointly with

the Centre for Research on North America at the UNAM and the Commission for Environmental Cooperation in North America.

**Michela Marcatti, PhD, MS**

Department of Anesthesiology, The University of Texas Medical branch, Galveston, TX

### Damaged Mitochondrial DNA as a potent inducer of lung inflammation

Marcatti Michela, Brunyanszki Attila, Szabo Csaba, Szczesny Bartosz.

Inflammatory lung diseases causing a substantial burden to patients, families, and the health care system in the world wide. Mitochondria, often viewed only as a major cellular source of energy, recently have been recognized as a central hub in response to oxidants particularly in highly oxygenated tissue including lungs. Our novel hypothesis is that mitochondrial DNA damage, induced by oxidative stress is a causative factor in the inflammation response of the pulmonary epithelial cell. We induced mild, moderate, and severe level of mitochondrial DNA damage in a normal lung epithelial cells (BEAS2B) by using glucose oxidase (GOX) that in presence of glucose generates hydrogen peroxide. These conditions resulted in the gradual and selective release of damaged mitochondrial DNA. This extrusion was mediated by exosomes where we could detect significant amount of mitochondrial but not nuclear DNA fragments upon stress. Moreover, using Proximity Ligation Assay (PLA) we found that Z Binding protein 1 (ZBP1) was the major intracellular mitochondrial DNA-sensing receptor. We also found that the cellular bioenergetics were severely impaired immediately after oxidative stress, and various cytokines/chemokines (IL1a, IL6, IL8, Gm-CSF, VEGF) were increased in response to mitochondrial DNA damage. Our current efforts focus on understanding the signaling by which damaged mitochondrial DNA is incorporated in the exosomes, and on whether extruded exosomes containing damaged mitochondrial DNA induce paracrine signaling to neighboring cells.

### *SHORT BIO*

I obtained Bachelor Degree in Biological Sciences and Master Degree in Biomedical Sciences in University of Palermo, Italy. My Ph.D. research project included characterization of the role of p53 mutant (p53-R248W) in promoting stemness features of human osteosarcoma (3AB-OS) cells, which was performed at the University of Palermo, Italy (first two years) and at the BRIC centre of Copenhagen, Denmark (one year). Recent data suggests that various mutant of p53 resulted in increasing growth rate and motility, tumorigenicity metastatic progression and invasiveness and decreasing sensitivity to chemotherapeutic drugs. In summary, my graduate training in cancer biology and developed expertise in technique commonly used in cancer research make me perfectly fit for this project. Actually, I'm Post-Doctoral Fellow at University of Texas Medical Branch (UTMB) in Galveston, Department of Anesthesiology and I'm working on Project: "Mitochondrial DNA: a target and effector of pulmonary epithelial cell injury", with goal investigate morphological and biochemical changes in epithelial cells induced by environmental pollutants.

**Claudia Marino, PharmD, PhD student**

### Hsp60 as a protective factor against amyloid beta misfolding

Marino<sup>1,2,3</sup> C., Mangione<sup>3</sup> M.R., Passantino<sup>3</sup> R., Vilasi<sup>3</sup> S., Cappello<sup>2,3,4</sup> F., Bulone<sup>3</sup> D., San Biagio<sup>3</sup> P.L., Taglialatela<sup>1</sup> G.

<sup>1</sup>Department of Neurology, the University of Texas Medical Branch at Galveston, Texas – USA; <sup>2</sup>Department of Experimental Biomedicine and Clinical Neuroscience, University of Palermo, Italy; <sup>3</sup>Institute of Biophysics, National Research Council, Palermo, Italy; <sup>4</sup>Euro-Mediterranean Institute of Science and Technology, Palermo, Italy

The increasing of aged population and the multitude of risks factors facilitating neurodegenerative disorders make Alzheimer's disease (AD) one of the most common cause of death worldwide. Even though the phenotype of AD is clinically well characterized, there are no therapies available. Therefore, a misbalance between protecting factors, due to normal aging, and neurotoxic agents seems to be well established. Particularly, there is evidence supporting the hypothesis that the aberrant cleavage of the Amyloid Precursor Protein (APP) by beta and gamma secretase is responsible for the formation of the neurotoxic amyloid beta peptide (A $\beta$ ) whose oligomers induce mitochondria dysfunction and neuronal death. Additionally, the aging related impairment of protective mechanisms, such as chaperones, seems to contribute to AD progression. Previous research suggests that chaperones, like Hsp60, are highly involved in triggering intracellular amyloid oligomers and in the prevention of neuronal damage. Our preliminary data suggest that Hsp60 is an effective inhibitor of A $\beta$  misfolding by inhibiting A $\beta$  aggregation. Here we want to investigate the mechanism of this protein-protein interaction in a cellular model, which better represent the physiopathology of AD. 7PA2, Chinese hamster ovary cells overexpressing human APP751 variant, that induces the overproduction of A $\beta$  oligomers, has been used to overexpress Hsp60. Western blotting, ELISA and immunocytochemistry have been used to assay A $\beta$  and Hsp60 in the whole cells and in subcellular and extracellular environments. We hypothesize that Hsp60 might be an effective inhibitor of neurotoxicity and the understanding of the biological mechanism could contribute to future AD therapies.

### *SHORT BIO*

Claudia Marino was born in Sicily, Italy. She graduated in Pharmacy *cum laude* at the University of Palermo in 2013 and the experimental thesis entitled "Photo-inhibition of A $\beta$  fibrillation mediated by a newly designed fluorinated oxadiazole" has been published in 2015. In December 2013, Claudia has been accepted to be part of the combined Neuroscience PhD program offered by the University of Palermo, Italy, and the University of Texas Medical Branch (UTMB) at Galveston, USA. She is currently developing her Ph.D. thesis in the laboratory of Dr. Giulio Taglialatela at the Neurology department at UTMB. Claudia Marino's research focuses on the investigation of biomolecular mechanisms involved in Alzheimer's disease pathogenesis.

**Emanuele Mocciaro, MS, PhD student**

Department of Anesthesiology; The University of Texas Medical Branch, Galveston, TX

### Short-Pulsed Laser Therapy (SPLT) for Traumatic Brain Injury: Effect on Neurogenesis

E. Mocciaro, R. Esenaliev, I. Petrov, Y. Petrov, D. Prough, M.A. Micci

**Background:** Traumatic brain injury (TBI) is a chronic disease that occurs after a head trauma and results in neurological dysfunctions that are still evident after many years from the original trauma. For this reason there is an increased interest in TBI, particularly for the study of a possible cure, which currently does not exist. Neurobiology, in the last few years, has focused on the study of “neurogenesis” subverting the old thinking of the inability of the brain to replace neurons. We now know that it is possible for the adult brain to generate new neurons from neuronal stem cells (NSC) located in the subventricular zone of the lateral ventricle and in the dentate gyrus of the hippocampus (an area of the brain that plays a critical role in memory and cognition). Recent data from Dr. Micci’s laboratory has shown that transcranial delivery of near-infrared light in combination with ultrasound stimulation (Short-Pulse Laser Therapy, SPLT), is neuroprotective in a rat model of brain trauma. The aim of this work is to study the ability of SPLT to stimulate NSC in the brain to proliferate and differentiate so as to repair the brain damage caused by TBI.

**Methods:** For the *in vivo* studies, SPLT was administered transcranially in a rat model of blast induced neurotrauma, 1 hour after injury. Proliferation of NSC in the hippocampus was studied by counting the number of cells incorporating bromodeoxyuridine (BrdU). For the *in vitro* studies hippocampal-derived neuronal stem cells (Hipp-NSC) isolated from the adult rat brain were maintained in culture and treated with SPLT for 5 minutes. Hipp-NSC proliferation was studied using an MTS-based assay. For differentiation studies, after SPLT, Hipp-NSC were plated onto poly-ornithine/laminin-coated plates and cultured in medium containing retinoic acid and 0.5% FBS for 7 days. Immunofluorescence and Western blot analyses were performed using specific antibodies against markers for neuronal ( $\beta$ III-tubulin) and glial (glial fibrillary acidic protein; GFAP) phenotypes. **Results:** SPLT increases the number of proliferating NSC in the hippocampus dentate gyrus in a rat model of brain trauma when applied 1 hour after injury. In order to better understand the mechanism underlying the effect of SPLT on NSC *in vivo*, we set up an *in vitro* system in which Hipp-NSC were treated with short pulse near-infrared laser light (NIL) alone or ultrasound (US) alone. Our data show that US increases Hipp-NSC proliferation in a dose-dependent manner (US generated from a short pulse laser of 4.3mJ/cm<sup>2</sup> intensity produces a 3 fold increase in proliferation as compared to untreated cells; reducing the intensity to 2.1mJ/cm<sup>2</sup> and 1mJ/cm<sup>2</sup> produces a 2 fold and 1.5 fold increase in proliferation respectively vs untreated cells). On the other hand, NIL alone does not affect proliferation of Hipp-NSC. Moreover, US treatment reduced the neuronal differentiation of Hipp-NSC 7 days after treatment (percentage of III-tubulin+ cells 15% +/- 2.2% in US-treated vs 30% +/- 3.1% in ctrl) while not affecting glia differentiation (percentage of GFAP+ cells: 18% +/- 1.7% in US-treated vs 16% +/- 1.1% in ctrl). This is in line with the observed proliferative effect of US on Hipp-NSC. We are currently studying the effect of NIL on Hipp-NSC differentiation. **Conclusion:** The main goal of this study is to

evaluate the efficacy of SPLT to stimulate neurogenesis in the brain as a possible therapeutic strategy for the treatment of brain injuries. Our results show that ultrasound waves generated by a short pulse near infrared laser increase proliferation of hippocampus NSC both *in vivo* and *in vitro*. The effect of ultrasounds might be mediated by mechanoreceptors on hipp-NSC that “feel” environmental changes by responding with an increase in proliferation. Further studies are currently ongoing to better understand the molecular changes that occur in Hipp-NSC after SPLT treatment.

#### *SHORT BIO*

Emanuele Mocciaro was born in Palermo (Italy) in 1987. He is currently a PhD candidate at the University of Texas Medical Branch (UTMB) in Galveston (TX) where he participates in a joint program between the University of Palermo and the Neuroscience Graduated Program at UTMB. He received a Bachelor's degree at University of Palermo in 2012 and a Master's degree at University of Bologna in 2014 with a thesis entitled “Storage of intramuscular fat with aging: different role of Plin2 and Plin5, two PAT's family proteins”. He is currently working on his PhD project in the Anesthesiology department at UTMB under the mentorship of Dr. Maria Adelaide Micci.

**Mauro Montalbano, MS, PhD student ---- [mamontal@utmb.edu](mailto:mamontal@utmb.edu)**

The University of Texas Medical Branch, Galveston, TX

Silencing of the glypican3 by siRNA inhibits growth, migration and invasiveness of primary human hepatocytes (cancer precursors) isolated from patients with hepatocellular carcinoma.

Mauro Montalbano, Cristiana Rastellini, Ali Shirafkan, Xiaofu Wang, Joshua McGuire, Janika Prapajita, Renza Vento and Luca Cicalese

**Introduction:** Glypican3 (GPC3) is one of the six members of the human glypican family, it is a heparan sulfate proteoglycan involved in cellular pathways of growth and differentiation in fetal liver tissue. The molecular characteristics of GPC3 and its role in cell physiology are still under investigation. Since GPC3 is found upregulated in hepatocellular carcinoma (HCC) cells although it is not expressed in normal and/or cirrhotic liver, we hypothesize that GPC3 can play a role in the molecular pathways of HCC development. We previously described, that the expression of GPC3 in primary human hepatocytes isolated from specified distances of HCC lesions of cirrhotic livers is associated with dynamic transformation of microscopically normal hepatocytes into early-tumor cells. **Methods:** Samples were isolated and cultured from 7 patients with cirrhosis /HCC and 3 patients with normal liver for 16 weeks. To study the characteristics of GPC3 we used immunofluorescence staining, protein extraction with western blot analysis, mRNA silencing using short interfering RNA (siRNA), cell death assays, trans-well invasion assay and scratch wound healing assay. **Results:** We here report, for the first time, that in early-HCC hepatocytes GPC3 starts to be detected after 5 culture passages. GPC3 was identified in two different forms and locations: The standard form (GPC3s: 70 kDa) (not cleaved) is mainly localized in the cytoplasm and cytoplasmic membrane near the nucleus and the N-terminal domain of GPC3 (N-GPC3: 40 kDa) is co-localized with -Tubulin of microtubules in the cytoplasm and extracellular side of the cell membrane in the lamellipodia of hepatocytes. Furthermore, we found standard form of GPC3s co-localized in central areas of the cells near the nucleus accompanied by its protease: "Furin-Convertase". Additionally, this enzyme is overexpressed, similarly to GPC3, in early-tumor cells and HCC cells after 5 culture passages. Intervening with siRNA resulted in blocking cell proliferation and induced apoptosis in the cells. This effect was more prominent in the early-tumor cells than HCC cells and was confirmed by FITC/AnnexinV – IP test and Hoechst 33342 assay. **Conclusion:** These data points out a divergent localization of GPC3s and N-GPC3 in the primary early-tumor and HCC cells. Silencing of GPC3 production blocked cellular proliferation and induced apoptosis in both cell populations. This reveals a potential therapeutic target preventing cancer transformation of HCC precursors with the inhibition of the expression and function of GPC3.

*SHORT BIO*

Mauro Montalbano obtained Bachelor Degree in Biological Sciences and Master Degree in Cellular and Molecular Biology in University of Palermo, Italy with a thesis on deacetylases Sirtuin-1 in breast cancer

cell line MDA-MB231. Actually, PhD candidate in University of Texas Medical Branch. He is PhD student with an extensive theoretical and technical knowledge in molecular and cell biology. He presented research findings in national and international meetings. Expertise in different laboratory techniques, mentoring graduate and medical students. His PhD training was focused on understanding of molecular and cellular mechanisms involved in transformation of primary human hepatocytes. His studies led to the discovery of new markers for early detection in Hepatocellular Carcinoma. He is currently working on the characterization of molecular mechanisms that are involved in Glypican-3 function in early cancer cells.



**Daniele Mortari, PhD** ---- [mortari@tamu.edu](mailto:mortari@tamu.edu)

Department of Aerospace Engineering, Texas A&M University, College Station, TX

“From Broglio’s “Sistema Quadrifoglio” to the Necklace Problem on Flower Constellations”

The Flower Constellations theory evolution will be summarized. Broglio’s “Sistema quadrifoglio” was the initial system that has generated the original theory of Flower Constellations. This new way to design satellite constellations is then evolved to the 2-D and 3-D Lattice versions and, finally, to the Necklace problem. The mathematics behind will be minimized and various examples and animations for potential current and futuristic applications will be shown.

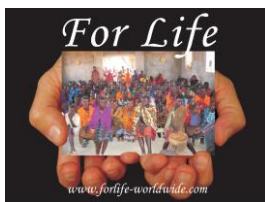
*SHORT BIO*



Daniele Mortari is full Professor of Aerospace Engineering at Texas A&M University, working on the field of attitude and position estimation, satellite constellation design, and sensor data processing. In addition, he has taught at the School of Aerospace Engineering of Rome’s University, and at Electronic Engineering of Perugia’s University. He received his dottore degree in Nuclear Engineering from University of Rome “La Sapienza,” in 1981. He is IEEE and AAS Fellow, AIAA Associate Fellow, Honorary Member of IEEE-AESS Space System Technical Panel, and former IEEE Distinguish Speaker. He has published about 300 papers and he has been widely recognized for his work, including receiving best paper Award from AAS/AIAA, two NASA’s Group Achievement Awards, 2003 Spacecraft Technology Center Award, the prestigious 2007 IEEE Judith A. Resnik Award and, recently, the 2016 AAS Dirk Brouwer Award.

## **Marcos Moura**

V. President- ONLUS



“For Life” si costituisce come associazione ONLUS nella primavera del 2005, dopo un viaggio in Uganda ospiti dei padri Comboniani.

E’ nato un progetto: supportare le missioni della Karamoja per:

- donare l’istruzione;
- donare l’acqua, il bene più prezioso e far partire il volano delle produzioni agricole locali;
- donare supporti per il dispensario, l’unico sostegno per le donne e bambini.

Forlife è diventato uno spazio proiettato verso i fratelli africani, un tentativo seppur minimo di sostegno in un territorio in cui la disuguaglianza sociale ha assunto proporzioni inaccettabili.

### **Attività:**

Scuola di teatro, corsi monotematici sul benessere psicofisico, di nutrizione naturale e Yoga, eventi e cene sociali, corsi di consapevolezza, dibattiti, concerti e attività creative, seminari e cineforum.

Partecipazione alle Celebrazioni della Giornata Mondiale dell'alimentazione 2010, 2011, 2012, promosse dal Ministero Degli Affari Esteri FAO e ONU, spettacoli e convegni di sensibilizzazione e di riflessione.

### **Progetti realizzati:**

dal 2005 le risorse sono state utilizzate per:

1. la costruzione di una scuola primaria;
2. ristrutturare edifici;
3. acquistare attrezzature per il dispensario: materassi, scambiatore d’ossigeno per i neonati, dotazioni per il reparto maternità;
4. avviare una campagna di vaccinazioni ai bambini e medicinali per i dispensari;
5. finanziare l’istruzione di infermieri;
6. acqua per una missione comboniana:  
sistema di irrigazione nel complesso della Missione di Kanawat – Kotido- Karamoja- Uganda.

La missione comboniana gestita da Padre Piero comprende un dispensario e il complesso scolastico che offre l'educazione elementare alla popolazione scolastica della regione accogliendo gli alunni della savana.

Scheda riassuntiva:

Progetto Irrigazione

Finalità: far crescere piante da frutto e facilitare la crescita dell'erba per il foraggio degli animali.

**Implementazione:**

Apertura di due pozzi d'acqua e posizionamento di cisterne sopraelevate per il contenimento dell'acqua, canali e sistemi di irrigazione, pompe di alimentazione alimentate con motore e ad energia solare.



Padre Piero mostra le piante e i solchi dell'acqua che si disperde



manutenzione continua.



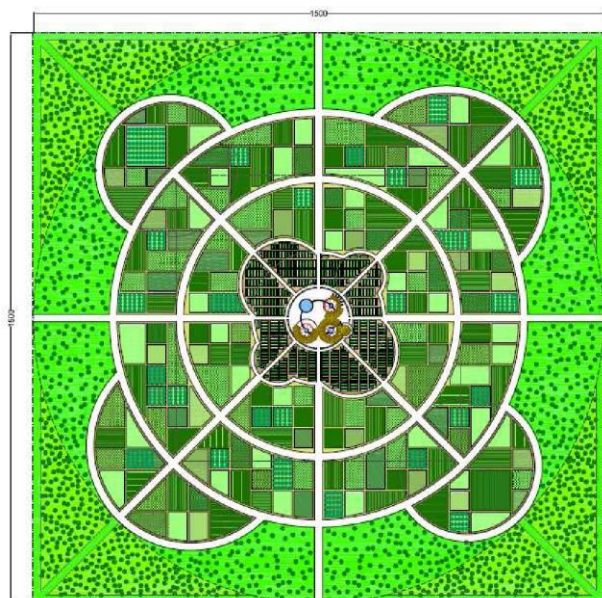
Tutti i progetti realizzati da ForLife sono stati documentati negli stadi di avanzamento dei lavori, per dare visibilità, ai sostenitori, dell'impiego dei fondi.

Un giorno l'Africa ha bussato alla porta di ForLife; i migranti della missione Africa, avevano perso il diritto all'ospitalità, da un giorno all'altro si erano ritrovati senza alcun supporto, da qui la decisione di accoglierne alcuni presso l'associazione che è stata trasformata per dare loro ospitalità.

E' stato acquisito un terreno e organizzato un orto per tenere impegnati i ragazzi e toglierli dall'inedia.

Un programma d'inserimento nel mondo del lavoro ha permesso loro di trovare una sistemazione lavorativa.

## 7 - Progetto -Villaggio Autosostenibile - da implementare



Progetto iniziale: Area Km. 1,5 x 1,5 con unità di ricerca e abitative al centro che richiama lo schema circolare delle attuali aree abitative.

Il progetto vede un'area piantumata e orti. Al centro un villaggio per ospitare le famiglie che usufruiranno di energia fotovoltaica e acqua per l'autosufficienza alimentare. Una struttura modulare che crescerà con la disponibilità dei fondi.

### **ONLUS - NGO- C.F. 91047560122**

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Lidia Musumeci — [lidia.musumeci@yahoo.it](mailto:lidia.musumeci@yahoo.it); Marcos Moura - - [ac.italy@yahoo.it](mailto:ac.italy@yahoo.it)

**Umberto Mucci ---- [info@wetheitalians.com](mailto:info@wetheitalians.com)**

**We the Italians. Two flags, One heart"**

This paper will discuss not only the origin and history of We the Italians --a web portal linked with social medias, a newsletter, a magazine and a partnerships network where everybody can share, promote, be informed and keep in touch with anything regarding Italy happening in the US—it will also discuss its goals and the importance of its Italian birth. Many Italians moved to the US in the past and, although a substantial number of Italians is still moving to the Unites States and is becoming successful oversea, only a few people in Italy are fully aware (and realize in full the significance) of this phenomenon which instead should be discussed and studied.

***SHORT BIO***

Umberto Mucci has a degree in Political Sciences International Address and an Advanced degree in Marketing and Communication. He is the Founder and CEO of We the Italians. He represents in Italy the Italian American Museum of New York. He has been the co-director of "èItalia for USA", a bimestral magazine regarding Italy in the US, and is Founder and has been Secretary General of Fondazione Roma Europea. He has been Head of International Relations of Innovarte for the exhibition "Italian Logos – Testimonies of the art to excel", and Head of the Diplomatic section of the magazine "Romacapitale". He is guest lecturer at Accent, where he lectures about the Italian emigration in the US and about the actual Italian presence in the US to students from Michigan State University, University of Minnesota and Santa Barbara City College. His new book about Italy and the US is "We the Italians. Two flags, One heart. One hundred interviews".

**Zarana S. Patel, Ph.D. ----**

Human Research Program at NASA Johnson Space Center

Development and Testing of an Autonomous, Dual-Chamber Bioreactor for Growth of 3-D Organotypic Cultures in Microgravity

Zarana S. Patel<sup>1,4</sup>, Matthew A. Wettergreen<sup>2</sup>, Janice L. Huff<sup>3,4</sup>

<sup>1</sup> Science, Technology and Engineering Group, Wyle, Houston, TX <sup>2</sup> Oshman Engineering Design Kitchen, Rice University, Houston, TX <sup>3</sup> Division of Space Life Sciences, USRA, Houston, TX <sup>4</sup> Biomedical Biomedical Research and Environmental Sciences Division, NASA Johnson Space Center, Houston, TX.

Our project involves the development of a novel platform that will enable microgravity research with advanced, 3-D organotypic tissue cultures that are widely used in ground-based laboratories for basic and translational biomedical research. These realistic 3-D tissue models accurately represent the morphological features, differentiation markers, and growth characteristics observed in normal human epithelial tissues, including the skin, esophagus, lung, breast, pancreas, and colon. Because these models require complex culture conditions, including an air-liquid interface, they have yet to be used for life sciences research on the International Space Station (ISS) despite their strong utility as organ mimics and their widespread applications in ground-based investigations. Therefore, the development of this new technology will provide the research platform required for enabling microgravity science research using these realistic 3-D tissue models, greatly increasing the capabilities of the ISS as a national laboratory. One potential application is the development of improved engineered tissue-replacements for clinical applications on Earth. In addition, this enabling technology will contribute significantly to advances in fundamental space biology investigations on questions regarding microgravity effects on normal tissue development, aging, cancer, and other disease processes. It will also allow for studies on how combined stressors, such as microgravity with radiation and nutritional deficiencies, affect multiple biological processes and will provide a platform for conducting countermeasure investigations on the ISS, thereby reducing the need for and expense of animal models. The ground-based portion of our project involves development and testing of the 3rd generation prototype bioreactor for the culture of the 3-D organotypic tissue models. The bioreactor will automate air-liquid, liquid-liquid, and liquid-air exchanges within the cell culture chambers. It will support multiple tissue types and its modular design will provide for incorporation of add-on capabilities such as microfluidics drug delivery, media sampling, and in situ biomarker analysis. Preliminary flight testing of the hardware was conducted in July 2015 on a parabolic platform through NASA's Flight Opportunities Program, using 3-D organotypic cultures for successful validation of the hardware. Supported by NASA Space Biology Award (#NNX13AM07G) to ZSP.



#### *SHORT BIO*

Dr. Patel is a senior scientist with Wyle in the Human Research Program at NASA Johnson Space Center. She is a graduate of Rice University with a degree in bioengineering and a focus on tissue engineering. Dr. Patel has extensive expertise in the development and use of tissue culture bioreactors as well as with the use of 3-D tissue models for research. She also has several years of experience with prototype development and parabolic flight testing of the bioreactor for 3-D organotypic culture in microgravity.



**Maurizio Pellegrino, PhD** ---- [maurizio.pellegrino@gmail.com](mailto:maurizio.pellegrino@gmail.com)

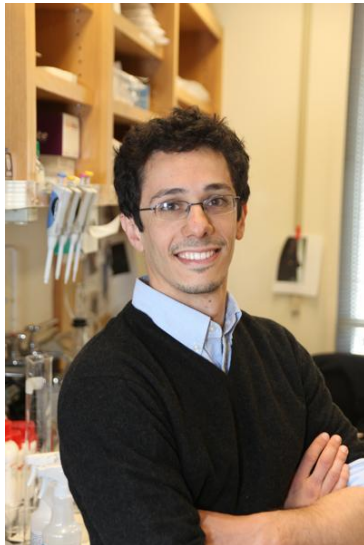
Mission Bio, San Francisco, CA

#### Droplet microfluidics for single cell genomics

The behaviors of complex biological systems are often dictated by the properties of their heterogeneous and sometimes rare cellular constituents. For example, cancers can be made of several subpopulations, some of which very rare, that dictate responses to treatment and prognosis: thus, the analysis of individual cells can reveal information often unattainable by studying the mixed population.

Mission Bio developed a droplet-based microfluidic system to detect and isolate genetic material from single cells with high-throughput: target cells are screened and isolated in a way similar to the security screening of single individuals at the airport. With this method, we can perform ~100,000 single-cell reactions in a single experiment and isolate the genetic material from rare cells for further analysis.

#### *SHORT BIO*



Maurizio Pellegrino is a Senior Scientist at Mission Bio, where he is developing the genomics platform for single-cell analysis. He received his Ph.D. in Neurobiology at The Rockefeller University in New York in Dr. Leslie Vosshall's lab, where he studied the insect sense of smell and how the insect repellent DEET works. He then moved to the University of California, Berkeley, where he conducted his postdoctoral work in Dr. Diana Bautista's lab studying gene expression in touch neurons.

**Davide Pietrobon, PhD** --- [daddeptr@gmail.com](mailto:daddeptr@gmail.com)  
HERE, Berkley, CA

### Down to Earth: precision map-making

HERE has been building maps for over thirty years. Nowadays, spatial accuracy is not the only metric for the best map: time has become a key variable to capture and incorporate events as they appear in the data stream. Connectivity has broadened the spectrum of the information that the modern cartographer can represent on a map, and the synergy of multiple devices makes the information flow through smart vehicles. Ultimately, users are connected if they can seamlessly navigate their lives and make sense of the world with intelligent and personal maps, while protecting privacy of user's location and personal data. I will describe how a physicist can help frame some of the many challenges providing a location cloud."

### *SHORT BIO*



Davide is a Senior Research Engineer at HERE, where as a member of the research group he strives to improve the navigation, mapping, and location experiences.

He received the bachelor in Physics in Modena, his home town. Soon after, his passion for analytic studies led him to Rome, where he graduated in theoretical Physics and joined the Ph.D. program in Astronomy. He spent two years in UK and graduated at the University of Portsmouth, obtaining a joint Ph.D.

At the California Institute of Technology, and later on at the University of California Berkeley, Davide dedicated his postdoc to analyze the fade music of the Universe revealed by the Planck mission (an ESA-NASA collaboration).

**V. Gustavo Priotto, Ing. ---- [gustavo.priotto-1@nasa.gov](mailto:gustavo.priotto-1@nasa.gov)**

Italian Space Agency (ASI) and Aerospace Logistics Technology Engineering Company (ALTEC)  
Liaison Office at the NASA Johnson Space Center

From the Italian Gateway to the International Space Station (ISS) to the Exomars Rover Operations



The Aerospace Logistics Technology Engineering Company (ALTEC) is the Italian center of excellence for the provision of engineering and logistics services to support operations and utilization of the ISS and the development and implementation of planetary exploration missions.

ALTEC is a public-private company owned by the Italian Space Agency (ASI), and the major European space company, Thales Alenia Space. ALTEC is headquarter in Turin, Italy, and has liaison offices at the National Aeronautic and Space Administration (NASA) and the European Space Agency (ESA).

ALTEC services range from engineering and logistics support, training of astronauts, to experiments support, including biomedicine, the processing of scientific data, the development, management and operation of the ground segment for space programs, and the promotion of space culture and education. The Italian Gateway to ISS means we are open to help bringing to the ISS experiments and payload for both scientific and commercial purposes.

ALTEC is strongly involved in the ESA program for Mars exploration setting up the Rover Control Center. Under the ESA ExoMars program, ALTEC is responsible for the design, development and management of the Rover Operations Control Centre (ROCC). The ROCC will be the center in charge of the monitoring and control of the system and science operations of the Rover on Mars' surface. It also includes the Science Operation Centre (SOC), carrying out selected science activities.

The ROCC will provide support during the Launch and Early Operations Phase (LEOP), interplanetary cruise, and Mars Orbit phases for the periodic checkout of the Rover in the

Spacecraft Composite. The ROCC is requested to remotely assess the transmitted data provided performing full Rover Mission Operations (including science operations) for the entire surface operations phase (nominal and extension).

In particular the main architecture of the ROCC essentially comprises:

- Ground Communication Infrastructure
- ROCC Operation Control System
- Mars Terrain Simulator

The Ground Communication Infrastructure provides the ROCC with all the operational communications necessary to conduct Rover Operations, in particular in support of TM/TC, as required for the implementation of the selected communication scenarios.

The ROCC Operations Control System will provide the core capabilities in direct support of Rover operations, for telemetry receiving and analysis, science and vehicle planning, simulation and sequence validation, on-board software management, command sequence uplink.

The Mars Terrain Simulation (MTS) Facility will support simulation of off-line nominal and non-nominal Rover surface operations, in particular for rehearsing, simulating and validating critical maneuvers of Rover, providing an easily reconfigurable Mars-like environment.

ALTEC has been in charge of the Rover Control Center following the experience acquired in support to the ISS, which is one of the most important and ambitious cooperation programs at the international level in the scientific and technological field ever undertaken, and can be considered the greatest engineering work ever achieved by man.

With the launch of the logistics module Leonardo, which took place in March 2001, Italy has become the third nation, after Russia and the United States, to send an ISS element into orbit.

Italy plays a dominant role in the program of development and utilization of the ISS, gained from having manufacturing about the 50% of the overall pressurized volume.

The habitable space of the ISS is equal to the volume of two jumbo jets and it includes, among other things, the laboratories for multidisciplinary research. It affords researchers opportunities without precedent in science and technology in areas such as physics, chemistry, biology, medicine, physiology, and Earth and universe sciences.

Researchers are supported by the National Space Agencies to develop and operate payloads on the ISS ambient. However, the new commercial pathway is rapidly evolving to access the ISS.



ALTEC is ready to support private/public entities which, with their own budget, are willing to exploit the ISS scenario for developing their experiments.

#### SHORT BIO



V. Gustavo Priotto is the Head of the Italian Space Agency (ASI) Engineering Johnson and the ALTEC Program cooperation on ISS control ISS Program

and Aerospace Logistics Technology Company (ALTEC) Liaison Office at the NASA Space Center, where he represents the ASI to the International Space Station (ISS) Office, and supports NASA and ASI's bilateral the ISS Program. He represents the ASI in the boards, ISS teams and working groups, and Reviews. He provides management support for ISS strategic, tactical and operational planning. Participates and support the ISS and Italian elements and payloads sustaining engineering activities. Coordinates the development and administration of NASA/ASI bilateral plans and agreements. Coordinates resolution of technical, as well as export control related issues. He represents ASI in the ISS Public Affairs Office events and ISS external relations.

ASI delivered three Multi-Purpose Logistics Modules (MPLMs) – Leonardo, Raffaello, and Donatello – to the United States for use on the ISS, each unit designed for multiple flights. In the 11 years from 2000 to 2011, MPLM performed 12 successful missions to the ISS on board the Space Shuttles Discovery, Endeavour and Atlantis. One of the MPLMs, Leonardo, has been converted into a Permanent Multipurpose Module (PMM), carried to orbit on February 2011, by the Space Shuttle Discovery and successfully berthed to the ISS, where it will remain for the life of the ISS. Mr. Priotto's role was vital for the foundation of the Permanent Multipurpose Module program. Overall, his responsibilities included designing, developing, planning and integrating the MPLMs and the PMM for flight into the Space Shuttle and the ISS. Inside the NASA Houston Mission Control Center (MCC-H), he operated as a Console Manager during the actual flights of all of these missions. He also provided real-time support to other significant ISS flights and operations. As an engineer, he is specializing in operations, utilization, and sustaining engineering. His duties currently include real time operations support, and ensuring that the PMM maintain operational capability.

Mr. Priotto previously held several key leadership positions and led multidisciplinary teams in the former Alenias' Space Systems Group, Turin, Italy, including engineering personnel management and supervision for different program phases, Operations and Logistics Manager and Sustaining Engineering Manager. His role was instrumental during the MPLMs design and development, and subsequent post-delivery processing and test at the NASA Kennedy Space Center (KSC) Launch/Landing Site and following operations phases. He also held key leadership positions in the initial development of the today's European Space Agency Columbus attached laboratory.

Mr. Priotto graduated in electronics engineering from the State University of Cordoba, Arg., and performed post-graduation studies at the University of Turin, Italy. He also performed Finmeccanicas' training courses

in project/program management, creating winning technical proposals, building high performance teams, and others.

He received numerous ASI, NASA, and Boeing outstanding contribution awards during the 27 years of ISS design, development and operations.



**Claudia Ratti, Ph. D. ---- [cratti@Central.UH.EDU](mailto:cratti@Central.UH.EDU)**

Physics Department, University of Houston, Houston, TX

### QuarkGluon Plasma

The research activity of Dr. Ratti is devoted to understand the properties of QuarkGluon Plasma (QGP) by calculating fundamental observables from first principles and systematically relating them, for the first time, to experimental measurements. Ordinary hadronic matter undergoes a phase transition to the QGP under extreme conditions of temperature or density. In the Universe, the reverse transition took place just a few microseconds after the Big Bang: the basic building blocks of nature, the hadrons, were formed at this time. Today, these conditions can be recreated in the laboratory, in ongoing Heavy-Ion Collisions (HICs) at RHIC and the LHC. On the theoretical side, the fundamental theory of strong interactions (QCD) can finally be solved under the same conditions, by numerically simulating the interactions between quarks and gluons on a discretized grid (lattice). Such simulations are running on the most powerful supercomputers in the world and allow a precise determination of the QGP properties from first principles. Dr. Ratti has been working on strongly interacting matter under extreme conditions and on QuarkGluon Plasma physics throughout her career and gave several fundamental contributions to the field. She published the precise value of the temperature at which the phase transition to the QGP occurs, as well as the equation of state of the strongly interacting medium created in heavy-ion collisions. More recently, she was able to relate the evolution of the experimental system to the QCD phase diagram obtained from first principles, by comparing experimental measurements for fluctuations of conserved charges to the results of her high-precision lattice QCD simulations. This work constitutes the first step towards a description of QuarkGluon Plasma in terms of the fundamental theory of strong interactions.

### *SHORT BIO*

Dr. Claudia Ratti received her Ph.D. in Theoretical Physics at the University of Torino (Italy) in 2003. She has been a postdoctoral researcher at the Technical University of Munich (Germany), ECT\* in Trento (Italy), State University of New York at Stony Brook (USA) and Wuppertal University (Germany). In 2010 she became junior professor and group leader at Torino University, thanks to a FIRB grant funded by the Italian Ministry of Education, University and Research. She recently became assistant professor at the Physics Department of the University of Houston. Author of more than fifty publications in peer-reviewed international journals, she presented the results of her research in more than eighty seminars at international conferences and universities. Thanks to her achievements she has been awarded the 2011 International Zonta prize for women in science and the 2012 prize “Giuseppe Borgia” for best Italian Physicist below 35, granted by the Italian Academy of Science (Accademia Nazionale dei Lincei). Her research is mainly focused on the study of strongly interacting matter under extreme conditions of temperature and density, such as the one created at the Large Hadron Collider (LHC) at CERN.





**Salvatore Saieva, MS, PhD student**

The University of Texas Medical Branch, Galveston, TX

Peripheral Adipose Tissue Insulin Resistance Alters Lipid Composition and Function of hippocampal Synapses.

Salvatore Saieva<sup>3,4</sup>, Hanaa S. Sallam<sup>1</sup>, Batbayar Tumurbaatar<sup>1</sup>, Wen-Ru Zhang<sup>2</sup>, Demidmaa Tuvdendorj<sup>1</sup>, Giulio Taglialatela<sup>2</sup>, Nicola Abate<sup>1</sup>.

<sup>1</sup>Department of Internal Medicine, Division of Endocrinology; <sup>2</sup>Mitchell Center for Neurodegenerative Diseases, Department of Neurology and <sup>3</sup>Neuroscience Graduate Program, University of Texas Medical Branch, Galveston, TX, USA; <sup>4</sup>Department of Biomedicine and Clinical Neurosciences, University of Palermo, Italy

Alzheimer's Disease (AD) and Type 2 Diabetes Mellitus (T2DM) are two of the most common diseases whose incidence is steadily increasing worldwide. Compelling epidemiological evidence indicates that these two disorders are linked, a notion further supported by the observation that many AD patients show also insulin resistance (IR), the key-feature of T2DM. This suggests that the metabolic alterations characterizing T2DM may be risk factors for AD and/or CNS dysfunctions in general. However, the molecular mechanism(s) linking T2DM to AD remains elusive, and understanding them is key to devise effective preventative approaches for AD. In this study we used an animal model (*AtENPP1-Tg*), characterized by the overexpression of the ecto-nucleotide pyrophosphate phosphodiesterase (ENPP1) and adipose tissue IR, systemic IR and ectopic fat deposition; ENPP1 is a negative regulator of insulin receptor activation whose expression is reportedly increased in humans with metabolic syndrome. Using this mouse model we determined whether IR and related metabolic alterations resulted in CNS deficits, including synapse lipid composition and synaptic vulnerability to A $\beta$ , the toxic protein found in the AD brain. When these mice are fed with a high-fat diet, they show a reduced expression of adipocyte-derived adiponectin and a higher susceptibility to a high-fat diet owed to the insulin resistance. We found that hippocampal synaptosomes isolated from the *AtENPP1-Tg* mice show altered lipid composition, including decreased phospholipids and increased triglycerides (TG) and diacylglycerol (DAG) in hippocampal synaptosomes isolated from HFD-fed *AtENPP1-Tg* mice. These changes were associated with downregulation of insulin receptor expression, decreased phosphorylation of the GluN1 glutamate receptor subunit (NMDAR), altered CREB phosphorylation and impaired basal synaptic transmission in the hippocampus. Moreover, we found that A $\beta$  oligomers promptly bind to brain slices from the *AtENPP1-Tg* mice as compared to wild-type mice. We further found that A $\beta$  binding to synapses may be reduced by adiponectin, an adipose tissue-derived hormone that is reduced in *AtENPP1-Tg* mice. Given that binding of A $\beta$  oligomers to synapses is the principal event that leads to onset and progression of cognitive decline in AD, our results suggest a new concept where increased synaptic vulnerability to A $\beta$  oligomers and consequent increased risk of AD may be driven by adipose tissue dysfunction and associated reduction of adiponectin production which ultimately underscores metabolic syndrome and systemic insulin resistance.) These observations strongly suggest a mechanistic link for increased risk of Alzheimer's disease in people with metabolic syndrome and T2DM centered on increased synaptic vulnerability to A $\beta$  and lays the foundation for the development of future effective therapeutic approaches.

### *SHORT BIO*

Salvatore Saieva is 29 years old. He achieved the Master's Degree in Pharmaceutical Chemistry and Technology at University of Palermo presenting a thesis dealing with the capability of Wharton's Jelly-derived Mesenchymal Stem Cells to differentiate in hepatocyte-like cells. Then, he was selected by University of Palermo for the attendance of an Advanced Course in Mass Spectrometry Methodologies and Applications during which he focused his studies on Proteomics. Now he is a PhD Student at University of Palermo in the International Course of Biomedicine and Neurosciences through which he was included in a jointed PhD program with University of Texas Medical Branch of Galveston, TX where he is attending the Neuroscience Graduate Program. His studies deal with the correlation between T2D and AD and the potential protective role of mesenchymal stem cells in the progression of the diabetes. This international program will allow him to achieve both the PhD degrees, Italian and US.

**Ahmad Salameh (Nasser), PhD. ---- [Ahmad.S.Salameh@uth.tmc.edu](mailto:Ahmad.S.Salameh@uth.tmc.edu)**

Institute of Molecular Medicine, University of Texas Health Science Center at Houston, Houston, TX

Identification and characterization of a functional HER3-biomarker LINC RNA-HER3, a long intragenic ncRNA estrogen-responsive upregulated in Breast Cancer

*Ahmad Salameh, N. Zhang and An Zhiqiang*

Accumulating evidence highlights the potential role of long non-coding RNAs (lncRNAs) as new biomarkers and therapeutic targets in solid tumors. However, the role of lncRNA expression in human breast cancer biology, prognosis and molecular classification remains largely unknown. Here, we report an estradiol-responsive long ncRNA, *LINC RNA-HER3* and expressed in breast cancer cells. *LINC RNA-HER3* encompass ~4kb on chromosome 15 and is highly conserved between mammals. *LINC RNA-HER3* RNA is detected in the nucleus, cytoplasm and extracellularly secreted by exosomes, suggesting epigenetic and paracrine role in gene regulation. Mechanistically, HER3 directly represses *LINC RNA-HER3* expression by binding to its minimal promoter within AT-rich region; *LINC RNA-HER3* also exhibits HER3-dependent functions promoting tumor growth-ERK12-dependent mechanism thus promoting cell cycle progression. Our findings provide new insights into unknown HER3 biological function and regulation that directly contribute to Breast cancer progression.

#### *SHORT BIO*

2001: B.A. & M.A. in Biology & Molecular Biology, University of Padua, Italy

2002-2005, Doctorate research dissertation in Biotechnology, Department of Molecular and Biotechnology at the University of Siena, Italy

2010 to present: Research Scientist

University of Texas Health Science Center at Houston and Department of and Genitourinary Medical Oncology, University of Texas M.D. Anderson Cancer Center. Over the last 5 years I have conducted several projects, in particular,

- Role of lncRNA in prostate and breast cancer, establishing a new experimental model for the study and therapy of human Prostate (PCA3/PRUNEN2) and breast (LINC RNA-HER3) cancer.
- Targeting adipocytes progenitors and Study of the multi-complex proteins role in fatty acid transportation from endothelium to adipocytes.

2008-2010: Postdoctoral Research Fellow, Department of Genitourinary Medical Oncology, University of Texas M.D Anderson Cancer Center,

2005-2008: research fellow in the lab of Prof. Salvatore Oliviero. "Role of MAPKs (ERK12, PI3K, P38 and JNKs), AP-1 and Pro- and anti-apoptotic factors in Endothelium (Blood and Lymphatic), Survival and Tumorigenesis.

## Francesca Scipioni, PhD

Lunar and Planetary Institute (LPI), Houston, TX

### The Role of Italy in Planetary Remote Sensing

Italian researchers occupy a leader position in the Solar System exploration. The major contribution is in the development of imaging spectrometers and radar sounders for ongoing and future planetary missions. The team located at the INAF-IAPS institute in Rome, in particular, contributed to the development of several planetary imaging spectrometers:

1. VIMS onboard the NASA-ESA-ASI Cassini mission to Saturn and its satellites (orbiting Saturn since 2004);
2. PFS and OMEGA aboard the ESA Mars Express mission (orbiting Mars since 2003);
3. VIRTIS onboard the ESA Rosetta mission, currently at comet 67P/Churyumov-Gerasimenko;
4. VIR onboard the NASA Dawn mission, which orbited the asteroid Vesta in 2011-12 and will enter orbit around the dwarf planet Ceres in 2015;
5. JIRAM onboard the NASA Juno mission, due to enter orbit around Jupiter in 2016;
6. VIHI onboard the ESA BepiColombo mission to explore the planet Mercury;
7. MAJIS for the future ESA JUICE mission to explore the icy Galilean satellites.

Notable planetary radars provided by the Italian Space Agency (ASI) are:

1. RADAR for the NASA-ESA-ASI Cassini mission;
2. MARSIS for the ESA Mars Express mission;
3. SHARAD for the NASA Mars Reconnaissance Orbiter's mission;
4. RIME for the future ESA JUICE mission.

Working in the Rome's team during my Ph.D., I got acquainted with the spectroscopic analysis of airless planetary bodies. My Ph.D. research was devoted to the analysis of data returned by the VIMS instrument onboard Cassini of the two icy satellites Dione and Rhea. I carried out a multivariate classification of their surface based on infrared spectroscopy data to understand how many homogeneous terrain types exist, and how do they distribute. Saturn's moons are primarily composed by water ice and the variations observed in the satellites' infrared spectral profiles are explained by differences in the ice grains dimensions, changes in the water ice abundance and the presence of some contaminants. This research allowed to correlate spectral information with geological features at different scales, which is a fundamental step towards understanding the evolution of the satellites.

In my current research activity, I am following up the analysis of VIMS data for three other Saturnian icy satellites: Enceladus, Mimas, and Thetys. The main goal is to highlight E-ring deposits and to search non-water ice contaminants on their surface. The infrared spectra of the three satellites will be analyzed to map the global variation of the main water ice absorption features. This study has the goal to clarify which kind of endogenous and exogenous processes take place on the surface of Saturn' satellites and to understand if they are common for all moons or if some satellite shows a unique behavior

### *SHORT BIO*

Francesca Scipioni, Ph.D., currently a post-doc fellow at the Lunar and Planetary Institute (LPI) in Houston. Past position: post-doc fellow at INAF-IAPS, Rome, to work on Cassini/VIMS data. Ph.D. In Astronomy achieved in December 2012 at the University of Rome “Tor Vergata”, with a thesis on “Spectroscopic identification and classification of terrain units on Dione’s and Rhea’s surfaces based on Cassini/VIMS data.”

**Victoria Surliuga, Ph.D. ---- [victoria.surliuga@ttu.edu](mailto:victoria.surliuga@ttu.edu)**

Department of Classical and Modern Languages and Literatures, Texas Tech University,  
Lubbock, TX

A Grant Winning Project in the Humanities: Curating *Ezio Gribaudo's Theaters of Memory* Art Exhibition.

This paper describes a research project in the arts and the humanities that has resulted in the award of grants and the creation of research synergies in my work, centered on Italian artist Ezio Gribaudo. Last year I was awarded a CH Foundation grant to curate an exhibition of this artist at the Louise Hopkins Underwood Center for the Arts in Lubbock, Texas. This project has generated publications (a book in English is now being published with New York art press Glitterati Incorporated), conference presentations, and invited lectures. Such string of events has increased my research activities in the arts and I was awarded internal grants from Texas Tech University. Because Gribaudo has worked for many years with Peggy Guggenheim, their collaboration is also part of my research. In turn, for the research on Guggenheim and patronage, I was awarded The 1905 Fellowship from the Mount Holyoke College Alumnae Association.

In this paper, I introduce Ezio Gribaudo's work. His award-winning production has been recognized with various international prizes, among which the IX Rome Quadriennale in 1965, the XXXIII Venice Biennale Prize (for graphic arts) in 1966, and the São Paulo Biennale in 1967. Gribaudo's prolific production and diversified activities have given him a highly significant presence in contemporary Italian art. He worked with Francis Bacon, Giorgio de Chirico, Willem De Kooning, Marcel Duchamp, Peggy Guggenheim, Joan Miró, Henry Moore, to mention a few artists and personalities with whom he crossed paths. Through his committed activity as an art publisher, he promoted many of the most relevant figures in modern art since the 1950s.

Gribaudo has developed various innovative ideas in both form and contents. His work includes a multimedia hybrid use in his art of the typographical industry, mechanical and manual presses, mixed techniques, together with traditional pictorial tools. Gribaudo's objective is to demonstrate that multimedia painting does not provide one single formal rendering; rather, it can bring together many intertextual approaches, unite text and image, and elevate both up to a level where visual art and literature are not disconnected.

*SHORT BIO*

Dr. Surliuga is an Associate Professor of Italian at Texas Tech University. She is a scholar of modern and contemporary Italian poetry and art, Italian cinema, a poet, and a translator. She has written on the relationship between poetry and painting in Giambattista Marino, on Federico Fellini, and on the poetry of Franco Loi, Giancarlo Majorino, Giampiero Neri, and Andrea Zanzotto. She is completing a volume on Italian actresses. Her website is <http://www.victoriasurliuga.com>.

**Erika Spissu PhD. ---- [espissu@gmail.com](mailto:espissu@gmail.com)**

CRiMM - Center of Research on Mobility Models (University of Cagliari), Cagliari, Italy

A Personalized Travel Planning (PTP) research program to reduce car dependence.

In this work, we present the results of a research program involving the design and implementation of a Voluntary Travel Behavior Change program (and in particular of Personalized Travel Planning, PTP) to reduce car dependence in Sardinia (Italy). The project, funded by the Sardinian Government, aimed to explore a soft policy measure that integrates persuasion techniques into the information approach. The proposed PTP was implemented from February 2011 to June 2012, offering personalized information about the negative effects of daily car use and the benefits of an existing sustainable mode. The 109 participants involved in the research program were selected among car drivers along the most congested corridor in Sardinia, between Cagliari and Quartu Sant'Elena (first and third most populated cities respectively), where a competitive but underutilized light rail had been operating along the same corridor for about two years.

In particular, the objective of the research program was to focus on the participants' perspective of the measure, step by step, identifying the most appropriate ways to intercept and involve them and to analyze the implications of personal and societal factors on behavior change. As PTP can be considered a relatively new transport strategy tool, there are a number of barriers to its effective and successful implementation and development, such as general skepticism over the validity and acceptance by policy makers, concerning the potential shift to sustainable modes.

In particular, this work reviews in detail the methodological approach (behavioral targeting, information delivery, evaluation issues), and participants' feedback (information material, motivators of change, personalized approach), including their corresponding implications on travel behavior change. The main results indicate high participation rates when targeting and selection involve a certain degree of personalization.

*SHORT BIO*

**Erika Spissu, PhD**

Erika Spissu, civil and environmental engineer, PhD in Transport Technique and Economics, over 10 years of academic and professional experience in travel behavior and modeling gained in Italy and in the United States. Her most recent work experience has been on toll roads, Market Research and truck route behavior.

**Italo Meloni**

Professor in Transport Planning at the Department of Civil & Environmental Engineering and Architecture, University of Cagliari, Italy. He is currently also director of CRiMM, the University centre for research on transport and mobility issues. His current research interests lies chiefly in promoting changes in travel behaviour for achieving more sustainable mobility, as well as in activity based and discrete choice modelling for travel demand forecasting.

**Benedetta Sanjust di Teulada, PhD**

She is Research Assistant at University of Cagliari, Italy. From July 2010 to present collaborates with the Center of Research of Mobility Models (CRiMM) in Activity-Travel survey, Activity Based analysis, Demand Transportation models. Research activity mainly focuses on sustainable mobility policies and behavioural models.



**Douglas Stephens** ---- [douglasstephens1@gmail.com](mailto:douglasstephens1@gmail.com)

President Pressure Pumping Baker Hughes

Our company, Baker Hughes Inc. is a large integrated oilfield services company conducting Research and Development into a wide range of field related to finding and developing hydrocarbons. We are leaders in key technologies such as horizontal drilling and hydraulic fracturing used to exploit unconventional oil and gas reserves. We work globally including in Italy and count amongst our largest customers ENI who have codeveloped some technologies with our researchers.

Over the last several year the oil and Gas Industry's ability to extract hydrocarbons profitably from reservoirs previously thought to be uneconomic has had a dramatic impact on the price of energy in world market and as a consequence a profound affect on the global economy.

I will present the application of these technologies, potential further advancements and some of the direct impact of these innovations on the economics of energy.

Pursuing A Child: An Interactive Qualitative Analysis of the Infertility Treatment Experience

The purpose of this exploratory study was to examine and compare the infertility experience of individuals who have difficulty bearing children and/or who undergo fertility treatments. Each year, millions of individuals discover they are unable to bear children. Nearly 15% of the US population is diagnosed with infertility (NIH, 2014). Considered as a serious and unexpected condition, infertility has been linked to psychological and physiological distress, including health complaints, depression, anxiety, and complicated bereavement (Berghuis and Stanton, 2002; van den Akker, 2005). However, little is known about how people experience infertility and infertility treatments. This study aimed at exploring how infertile individuals process their medical condition, and how they cope with the stress of undergoing treatments. To achieve this goal, this study sought to identify elements that make up the infertility treatment experience and their interactions. This researcher used the Interactive Qualitative Analysis (IQA) grounded framework (Northcutt & McCoy, 2004) to reconcile quantitative and qualitative data collection. Flyers in medical facilities and infertility support groups in Central Texas were used to recruit fifty individuals. Initially, participants attended focus groups to identify common elements surrounding the infertility experience. Analysis of the data gathered in the focus groups revealed ten main categories that make up the infertility treatment experience. Each category was also comprised by sub-categories. A total of seventy-six sub-categories were identified. Using these elements, the researcher developed surveys and a semi-structured interview. The interviews provided participants' rich stories while the surveys measured satisfaction of experiences. Theoretical coding of all the elements, and their relationships, produced a system made of the these elements and their interactions. Thematic analysis of the System's elements, and their interactions, enabled this researcher to pinpoint the more difficult aspects of both the condition and the process, and therefore contributed to the understanding of the quality of treatments, as well as the quality of experiences. Examination of the system provided insight and solutions into common problems and allowed the author to identify how certain conditions are able to produce positive and negative outcomes in the system. These outcomes can be used to draw conclusions and develop solutions and intervention programs geared toward improving the overall Infertility Treatment Experience. Additionally, statistical analysis of the infertility treatment experience elements and their interactions showed that the cost of treatments and time pressures correlate with a more negative experience. In addition, knowledge of the topic and receiving support from individuals who are also experiencing infertility were more positively rated. The findings of this study are useful in identifying problematic aspects surrounding this experience, and for providing an opportunity to develop tools aimed at making the process of undergoing treatments easier. This study is a groundbreaking approach to an emerging medical and psychological issue of increasing importance throughout America, and across the globe. Through the identified Infertility Treatment System, we are able to better develop solutions and approaches to future programs and interventions.

## *SHORT BIO*

Dr. Rosalinda Strano Burton was born and raised in Lentini (SR), Italy. She moved to Texas in 1995 and worked as a financial professional for several years. She earned a Bachelor of Science in Human Development and Family Sciences with a minor in Early Childhood Intervention, and a Master degree focusing on Child Development and Attachment in Human Development and Family Sciences at the University of Texas at Austin in 2008 and 2011 respectively. She also earned a PhD in Human Development and Family Sciences at The University of Texas at Austin in 2015. Her research concentrates on how infertility issues and treatments affect individuals, couples, and families psychologically. Discovering the factors that influence the infertility experience has enabled Dr. Strano Burton to pinpoint the more difficult aspects of the process, and ultimately allowed her to develop tools aimed at assisting and helping people during their journey to parenthood. She is a member of the University Honor Society, the Society for Research in Child Development, the Society for Research in Human Development, and RESOLVE, the national infertility association. Rosalinda is also a specialist and educator in Positive Guidance Parenting, a parenting philosophy that focuses on supporting the development of children through nurturing parent-child relationships based on patience, empathy, as well as positive and purposeful language. Dr. Strano Burton worked as an early childhood educator throughout her academic career. She also worked for the University of Texas Health Science Center at San Antonio in the Division of Community Pediatrics. She is now dedicated to offering counseling services to individual who navigate through infertility and leads a RESOLVE infertility support group. Dr. Strano Burton has presented at numerous seminars, conferences and in academic class settings on topics including parental guidance, attachment, and fertility.

**Roberto Trucco, Ph.D.**

ExoMars Rover Operations Control Center, ALTEC-Torino, Italy

From the Italian Gateway to the International Space Station (ISS) to the Exomars Rover Operations



The Aerospace Logistics Technology Engineering Company (ALTEC) is the Italian center of excellence for the provision of engineering and logistics services to support operations and utilization of the ISS and the development and implementation of planetary exploration missions.

ALTEC is a public-private company owned by the Italian Space Agency (ASI), and the major European space company, Thales Alenia Space. ALTEC is headquarter in Turin, Italy, and has liaison offices at the National Aeronautic and Space Administration (NASA) and the European Space Agency (ESA).

ALTEC services range from engineering and logistics support, training of astronauts, to experiments support, including biomedicine, the processing of scientific data, the development, management and operation of the ground segment for space programs, and the promotion of space culture and education. The Italian Gateway to ISS means we are open to help bringing to the ISS experiments and payload for both scientific and commercial purposes.

ALTEC is strongly involved in the ESA program for Mars exploration setting up the Rover Control Center. Under the ESA ExoMars program, ALTEC is responsible for the design, development and management of the Rover Operations Control Centre (ROCC). The ROCC will be the center in charge of the monitoring and control of the system and science operations of the Rover on Mars' surface. It also includes the Science Operation Centre (SOC), carrying out selected science activities.

The ROCC will provide support during the Launch and Early Operations Phase (LEOP), interplanetary cruise, and Mars Orbit phases for the periodic checkout of the Rover in the Spacecraft Composite. The ROCC is requested to remotely assess the transmitted data provided

performing full Rover Mission Operations (including science operations) for the entire surface operations phase (nominal and extension).

In particular the main architecture of the ROCC essentially comprises:

- Ground Communication Infrastructure
- ROCC Operation Control System
- Mars Terrain Simulator

The Ground Communication Infrastructure provides the ROCC with all the operational communications necessary to conduct Rover Operations, in particular in support of TM/TC, as required for the implementation of the selected communication scenarios.

The ROCC Operations Control System will provide the core capabilities in direct support of Rover operations, for telemetry receiving and analysis, science and vehicle planning, simulation and sequence validation, on-board software management, command sequence uplink.

The Mars Terrain Simulation (MTS) Facility will support simulation of off-line nominal and non-nominal Rover surface operations, in particular for rehearsing, simulating and validating critical maneuvers of Rover, providing an easily reconfigurable Mars-like environment.

ALTEC has been in charge of the Rover Control Center following the experience acquired in support to the ISS, which is one of the most important and ambitious cooperation programs at the international level in the scientific and technological field ever undertaken, and can be considered the greatest engineering work ever achieved by man.

With the launch of the logistics module Leonardo, which took place in March 2001, Italy has become the third nation, after Russia and the United States, to send an ISS element into orbit.

Italy plays a dominant role in the program of development and utilization of the ISS, gained from having manufacturing about the 50% of the overall pressurized volume.

The habitable space of the ISS is equal to the volume of two jumbo jets and it includes, among other things, the laboratories for multidisciplinary research. It affords researchers opportunities without precedent in science and technology in areas such as physics, chemistry, biology, medicine, physiology, and Earth and universe sciences.

Researchers are supported by the National Space Agencies to develop and operate payloads on the ISS ambient. However, the new commercial pathway is rapidly evolving to access the ISS.



ALTEC is ready to support private/public entities which, with their own budget, are willing to exploit the ISS scenario for developing their experiments.

#### *SHORT BIO*



Experimental thesis at CNR "Istituto Colonnetti". He entered in AERITALIA in 1982 was the program IRIS (Phase C/D) as thermal participation at the launch campaign control). After this experience he was involved (Phase B) in the frame of Design & analysis of components for fluid loop and Design & Support Equipments (FGSE). He also of the launch campaign and operative phase involved in the COLUMBUS program (Phase (Cologne) following also some aspects of pressurized payload integration.

Roberto Trucco has a Ph.D. in Mechanical Engineer at the Politecnico of Turin, with metrologico Gustavo and his first experience analyst including the preparation (thermal in EURECA Program Thermofluidynamic analysis of Fluid Ground supported the preparation (thermal control). He was A). Resident in DFVLR

He joined the Tethered Satellite program (Phase C/D) as Thermal control subsystem responsible. Participating also at the mission operative phase (thermal control). He was involved in the HERMES program as proposal manager for some thermal equipments (passive and active) and after the closure of the project he was collocated in Friedrichshafen (Germany) as thermostructural engineer for the program ARISTOTELES. After the co-location he became study manager for the AERITALIA Contribution. After this experience he became study manager of the Gravity Explorer Mission(phase A)(later GOCE). He has been program manager of phase C/D of Hexapod Pointing System (ISS external payload) and Program Manager of Coarse Pointing Device during phase B-C/D consolidation phase.

Roberto Trucco joined ALTEC S.p.A. as responsible of the ISS utilization area and member of the ESA PL-MB (Payload Management Board) and ESA Mission Implementation Status Review (MISR) . In this role (with several collocation in ESTEC) he was involved as Payload Integration Manager (PIM) support for EDR, FSL, SOLAR, EuTEF projects.

He has been nominated Responsible of Space Exploration Program Line and Program Manager of ExoMars Rover Operations Control Center (ROCC).

**Ambassador Chase Untermeyer ---- [chase@untermeyer.com](mailto:chase@untermeyer.com)**

Former US Ambassador to Qatar

Immigration: The Old but New Issue in US Politics

#### *SHORT BIO*

Chase Untermeyer has held both elected and appointed office at all four levels of government – local, state, national, and international – with work in journalism, academia, and business as well.

After graduating from Harvard College in 1968, he was an officer in the United States Navy, a political reporter for the *Houston Chronicle*, and a member of the Texas House of Representatives. He left the Legislature in 1981 to go to Washington as executive assistant to then-Vice President George H.W. Bush. Three years later, President Reagan appointed him Assistant Secretary of the Navy for Manpower & Reserve Affairs. Mr Untermeyer returned to the White House in 1989 as Director of Presidential Personnel, and in 1991 the first President Bush appointed him Director of the Voice of America. From 2004 to 2007 he was United States ambassador to Qatar on appointment of President George W. Bush.

Ambassador Untermeyer is the author of two volumes of memoirs of the Reagan-Bush era, *When Things Went Right* and *Inside Reagan's Navy*. He has also published *How Important People Act: Behaving Yourself in Public*. A third volume of memoirs, *Zenith: The Presidency of George HW Bush*, will appear in late 2016.

## **Diego Urbina, MS**

Space Applications Services NV/SA, Zaventem, Belgium

### *SHORT BIO*

Diego Urbina is a Colombian-born Italian. He has Master of Science and a Bachelor's degree in Electronics Engineering from the Turin Polytechnic University in Italy, and a Master of Science in Space Studies from the International Space University in France.

He was an ESA-selected crewmember in the Mars500 Mission, holding the World record as one of the 6 humans to have spent the longest time isolated from the natural world, during 520 days, in the first simulation of a round trip to Mars, in Moscow, Russia.

Diego is a Systems Engineer at Space Applications Services in Belgium. He currently works on European Union and ESA projects aiming at creating new environments to simulate planetary missions on Earth (Moonwalk, ESA LUNA, ESA Moondive), creating robots that use the sunlight and lunar dust to 3D print habitats on the Moon (RegoLight), and also in exploiting robotic subsea operations in order to create new technologies that can help us explore the solar system (DexROV).

Mr. Urbina has worked at the training division of the European Astronaut Centre in Cologne, Germany, as an operations engineer in the CAVES course, and the Neutral Buoyancy Facility, supporting spacewalk training.



**Maria Xenia Wells Zevelechi ---- mxwells@utexas.edu**

Paolo Volponi - Adriano Olivetti, a friendship and collaboration

Paolo Volponi (1924-1994) started his literary career as a poet (*Il Ramarro/Le porte dell' Apennino*, 1948) but is known especially for his novels, where he addressed the theme of alienation of man in the industrial world, or, as he put it in an interview, at his home in Milano: "Industry is the de-humanization of the human". This concept is very clearly described in his first novel "Memoriale" (1962), where the main character is given an initial hope, at the start of a new life, after he had come home from the war, to a New Italy, working in an industry in Ivrea (compare, with the Olivetti, in real life) and then is taken in a downwards spiral, of emotional and physical deterioration. It is perhaps the darkest of Volponi's novels. And what is fascinating is that he compares the new hope of the man with that of the country.

Volponi worked for Olivetti from 1950 to 1971 and for Fiat, from 1972 to 1975, in the area of the Social Relations and the reconstruction of the South, in the housing and land office.

He was a Senator from 1983 to 1987).

In addressing the alienation of man in the industrial civilization, he expressed/described a sense of frustration, an increasing distancing from reality, towards an abyss of desperation and actual physical malaise. It was a novel approach in the literary aspect of the novel/essays which will continue with his other novels, "La Macchina Mondiale" and "Corporale".

"Il Sipario Ducale" is an almost biographical theme of growing up in the city of Urbino, which is also reflected in his poems.

I will limit myself to the theme of "Memoriale" which really contains all the sub-themes, literary and personal progress, but, interestingly enough, always accompanied by the theme he first expressed in his poems.

I presented this theme at a conference in Torino, of the title as above, where I met Volponi for the first time. I met him again at his home in Milano and at another conference in Provo, Utah. At an AAIS conference, in the Spring of 1990, I chaired a session on Volponi and dedicated it to the memory of his son Roberto, who had died in an airplane crash in Havana on September 3, 1989.

The manuscripts and typescripts of his early poems and "Memoriale" are part of the Italian Collections at the HRHRC/UT Austin. The manuscript has been my research guideline, my "fil rouge" to a clear understanding of his work.

### *SHORT BIO*



Dr. Maria Xenia Wells Zevelechi is an Emerita at UT Austin and Consultant for the Italian collections at the Harry Ransom Humanities Research Center, the University of Texas at Austin. She received a Doctorate in Literatures and Languages at the University of Pisa. She spent one year at the University of Texas with a Fulbright Scholarship, and a month at the American Academy in Rome.

Upon completing her Doctorate, she was invited to teach at the University of Texas, in the French and Italian Department. She also received a Fulbright Research Award to work at the Central State Archives in Rome, in the Carlo Levi Archive. In 1987 she organized a Symposium, at the University of Texas, on "Il Gattopardo, Literature, History and Film" with the participation of il Principe di Lampedusa, Giuseppe Lo Piccolo, Gioacchino Lanza Tommasi and Burt Lancaster. She has given lectures in the U.S.A. Italy, (University of Bergamo, Central State Archives, Rome, University of Pavia, and Trieste) Belgium (Universite' Libre de Bruxelles and Universite' de Liege) Oxford, Spain (Universidad de Oviedo) France (Universite' de la Savoy, Chambéry) and the Italian Cultural Center in Istanbul. In 1988 she gave one of the Centennial Lectures at the University of Bologna, on the occasion of the University 9th Centenary, on the topic "I Lettori del '500: corrispondenza dell'Accademia degli Oziosi) by invitation of the Rettore Fabio Roversi Monaco. As Liaison between the University of Texas, the Italian Embassy, and the Italian Consulate in Houston, she organized visits of Ambassadors and Consuls to the University of Texas, and helped any Italian citizen who needed to come to Austin for study or business. In 1992 she received the Order of Merit of the Italian Republic. She is also a member of the Italian Cultural and Community Center in Houston.