CASE WESTERN RESERVE UNIVERSITY | INSTITUTE FOR THE SCIENCE OF ORIGINS

Real Science Now

The Newest Science and Medicine Unblinkingly Distilled for the Public, Press and Republican National Convention.

Saturday 7/16/16
8:30am-5pm
No RSVP needed
Free and Open to the Public
Great Lakes Science Center, 601 Erieside Ave, Cleveland, OH 44114
http://www.greatscience.com/plan-your-visit/directions-and-parking.aspx
For More Info: Glenn Starkman, 216-235-9598 cell/text, Origins@case.edu
or Patricia Princehouse, 440-478-5292 cell/text, Evolution@case.edu
Website: http://origins.case.edu/rnc/

Top scientists on what's now and what's next! From new planets to curing cancer to virtual reality, human evolution, climate change, stem cells, viruses, nanoscience, black holes, the Higgs boson, water, energy, GMOs, HIV, DNA, antibiotic resistance in medicine and agriculture, addiction, autism, the brain, sleep, health care designed for your own personal genetics, and much more –understandable précis direct from real scientists in the real world of science and medicine!

- Hubble called it "disciplined imagination" and "a healthy skepticism"; others call it controversial, even dangerous. Science seeks the facts about the natural world and our place in it.

- Science allowed the US to rise to global prominence in technology, industry and economics. Now, other countries are using it to challenge our power and build their own economies.

- How can the public and politicians understand the surprising innovations and discoveries of science and put them to use to make our citizens and our world better?

Schedule

Doors open
8am

Auditorium
8:30am-5pm Lectures

Promenade
9am-5pm Extended Q&A with speakers as available
Media interviews with speakers & scientists as available

Auditorium
8:30 Glenn Starkman- Welcome
8:35 Bud Baeslack- "*Introduction: Thinking Beyond the Possible"*
8:50 Patricia Princehouse- *"Evolution: The Origins of New Species"*
9:10 Cynthia Beall- *"Oxygen: Adaptation and Human Performance in Thin Air"*
9:30 Michael Decker- *"Brain: What Happens to Humans who Live and Work at Ultra-High Altitude"*
9:50 Joe LaManna- *"Brain: The Link between Stroke, Aging, and Diet"*
10:10 Jeremy Rich- *"Stem Cells: New Strategies Against Brain Cancer"*
10:30 Lynn Singer-*"The New Childhood Illnesses: Addiction, Autism and Lead Poisoning"*
10:50 Jerold Goldberg- *Oral Health: Not Brushing Can Damage Your Heart*
11:10 Scott Simpson- *Human Evolution: Recent Advances in Unraveling the Complexity of our Ancestry.*
11:30 Sarah Boysen: "*Chimpanzee Cognition: Why Chimps Do Math"*
11:50 Glenn Starkman- "*Cosmos: What's New in the Universe?"*
12:10 David Spergel- *"Exoplanets: What 3000 New Planets are Telling Us About Our Own"*
12:30 Tom Giblin- *"The Universe: Black Holes, Gravitational Waves, and Why We Care"*
12:50 Glenn Starkman - *"The Higgs: Final Great Discovery of Particle Physics?"*
1:10 Robert Savinell- *Sustainability: Breakthroughs in Green Energy Storage*
1:30 BREAK
1:50 Stan Gerson- *"Cancer Moonshot: Sea Change in Cancer Research?"*
2:10 Mark Griswold- *"MRF Imaging: Revolution in Detecting Cancer, MS & Heart Disease"*
2:30 Charis Eng-*"Genomic Medicine: What Gene-Based Personalized Healthcare Will Look Like"*
2:50 Jonathan Karn- *"HIV: Where We Go From Here"*
3:10 Laura Kahn- *"Microbial Resistance: Can we have pork chops and antibiotics too?"*
3:30 Steve Rissing- *"Evolutionary Epidemics: Zika, Ebola, Flu, What's Next?"*
3:50 Chris Cullis- *"GMO: Friend Not Foe"*
4:10 Andy Jones- *"Environmental Crises: Water, Biodiversity, Climate Change"*
4:30 Alethea Barbaro- "*Math Modeling: From Fish Schools to Gang Behavior to Medicine"*
4:50 Glenn Starkman- *Conclusions and Beginnings*

List of Speakers

(alphabetical)

Baeslack, Bud
Barbaro, Alethea
Beall, Cynthia
Boysen, Sarah
Cullis, Chris
Decker, Michael
Eng, Charis
Gerson, Stanton
Giblin, Tom
Goldberg, Jerry
Griswold, Mark
Kahn, Laura
Karn, Jonathan
LaManna, Joe
Princehouse, Patricia
Rich, Jeremy
Rissing, Steve
Savinell, Robert
Simpson, Scott
Singer, Lynn
Spergel, David
Starkman, Glenn
Strangi, Giuseppe

Bio-sketches

Baeslack, Bud

Internationally recognized for his research on the materials science and engineering aspects of joining advanced aerospace materials, including titanium, aluminum and nickel-base alloys, intermetallics and metal-matrix composites, William A. "Bud" Baeslack III is Provost and Executive Vice President at Case Western Reserve University, and formerly served as Dean of Engineering at The Ohio State University and President of the OSU Research Foundation and Dean of the School of Engineering at Rensselaer Polytechnic Institute, during a period in which the Institute created and implemented its highly successful Rensselaer Plan. Baeslack also served at the U.S. Air Force Materials Laboratory as a materials engineer and technical area manager and has received research funding from the Office of Naval Research, the Army Research Office, the Air Force Office of Scientific Research, the National Science Foundation, the Ohio Edison Program, national laboratories and industry. Baeslack and his students have authored over one hundred and fifty journal and proceedings articles.

Short: Expert on welding advanced aerospace materials; Provost and VP of Case Western Reserve University

briefing

Barbaro, Alethea

An expert on mathematical models in the context of kinetic theory, particularly applications of interacting particle models and agent-based models applied to such diverse contexts as fish migration, human gang rivalries and territorial development, and medicine, one of Prof. Barbaro's particular interests is the kinetic and hydrodynamic limits of these models at microscopic, mesoscopic, and macroscopic scales, especially those that undergo phase transitions as parameters are varied.

Short: Expert on mathematical models applied to diverse contexts such as medicine, fish migration, and street gangs.

Beall, Cynthia

A leading expert on adaptation to thin air at high altitude, Dr Beall is Co-Director of the Center for Research on Tibet, Sarah Idell Pyle Professor of Anthropology, and Distinguished University Professor at Case Western Reserve University. She is a board member of the American Association for the Advancement of Science (publishers of Science magazine), and a member of the American Academy of Arts and Sciences, the American Philosophical Society, and the National Academy of Sciences.

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Short: Biological anthropologist, Director, Center for Research on Tibet, expert on hypoxia

Boysen, Sarah

Founding Director of the Chimpanzee Center and the Comparative Cognition Project at Ohio State University, Dr. Boysen's research has focused on chimpanzees' cognitive abilities in relation to intelligence, conceptual understanding, and neuroscience. An Ohio native, she was selected as the one of the top 50 women scientists by Discover Magazine.

Short: Chimpanzee intelligence expert; Discover Magazine top 50 women scientists in the world.

Cullis, Chris

Founder of the biotech NovoMark Technologies and former Program Director of the Plant Genome Research Program at the National Science Foundation, Dr. Cullis is Frances Hobart Herrick Professor of Biology and former Dean at Case Western Reserve University. His molecular genetics work on food and textile crops addresses modes of evolution in which beneficial mutations arise rapidly, especially via environmentally-induced genomic destabilization. The insight into the mechanisms by which these variants are generated can be applied for quality control of in vitro produced plants and to develop stress tolerant (transgenic or conventional) crops as well. Raised in Rhodesia, he is currently in the process of domesticating an African desert plant with nutritional properties superior to soybeans.

Short: Expert on biotechnology and genetics/genomics of plants, including GMOS.

Decker, Michael

Formerly of the Centers for Disease Control and Prevention Chronic Viral Diseases branch and with extensive experience characterizing central nervous system dysfunction in humans, Dr. Decker, is Associate Professor of Nursing, Physiology, and Biophysics at Case Western Reserve University and Laboratory Director of the Nursing Neuroscience Lab, which emphasizes development of novel interventions and treatments to reduce the burden of neural dysfunction. Concurrent efforts focus on defining physiologic and genetic mechanisms conferring resiliency to environmental insults, and medically-unexplainable fatigue, as well as new electroceutical biotechnology. He is a Diplomate of the American Board of Sleep Medicine.

Short: Expert on the brain, sleep, and human physiological resilience in extreme environments.

Eng, Charis

Cleveland Clinic's Sondra J. and Stephen R. Hardis Endowed Chair of Cancer Genomic Medicine, Dr. Eng is Chair and founding Director of the Genomic Medicine Institute, founding Director of the Center for Personalized Genetic Healthcare, and Professor and Vice Chairman of the Department of Genetics and genome sciences at Case Western Reserve University School of Medicine. A member of the National Academy of Medicine who has served on the DHHS Secretary's Advisory Committee on Genetics, Healthcare and Society, she has done pioneering research widely acknowledged as the paradigm for the practice of precision oncology. Her personalized healthcare approach fulfills the adage "Knowledge is Power."

Short: Director, Genomic Medicine Institute, member the National Academy of Medicine, DHHS Secretary's Advisory Committee on Genetics, Healthcare and Society, pioneering research on precision oncology.

Gerson, Stanton

Founding director of the National Center for Regenerative Medicine, Dr. Gerson is director of the super-successful Case Comprehensive Cancer Center and is the Asa and Patricia Shiverick- Jane Shiverick (Tripp) Professor of Hematological Oncology. He is a world expert on stem cells and the correction of genetic disorders.

Short: Founding director, National Center for Regenerative Medicine, director of Case Comprehensive Cancer Center

Giblin, John T., Jr. (Tom)

An expert in cosmology and astrophysics, gravitational waves, and computational physics, Dr. Giblin is the Harvey F. Lodish Development Professor of Natural Science and Associate Professor of Physics at Kenyon College. His work concerns models of the early universe that satisfy current observational tests and finding new ways to discriminate between these models. He is particularly interested in how gravity and quantum field theory can lead to natural models of the early universe and specifically how these models might emerge from various extensions of the Standard Model.

Short: Astrophysicist, expert on gravitational waves, early universe

Goldberg, Jerold

Oral & maxillofacial surgeon and former Dean of Dental Medicine, at CWRU Dental School/University Hospitals of Cleveland and former Interim Provost and University Senior Vice President, Dr. Goldberg's areas of clinical and research interest include the treatment of children with congenital facial deformities, patience suffering from facial pain, and orthognathic surgery. Former chair for the section of Oral & Maxillofacial Surgery of the American Association of Dental Schools, he served on the Administrative Board of the Council of Deans of the American Dental Education Association, and participated in the national board construction committee for the ADA and the advisory committee for the American Board of Oral & Maxillofacial Surgeons.

<u>*Short:*</u> Expert on facial deformities in children. Research on the link between oral health and general health.

Griswold, Mark

Microsoft HoloLens collaborator and NORTECH "Inventor of the Year", Dr. Griswold created Magnetic Resonance Fingerprinting (MRF) a technology that allows early identification of devastating diseases like cancer, multiple sclerosis, and heart disease. Professor at Case Western Reserve University with appointments in radiology, biomedical engineering, physics and electrical engineering and computer science, he leads the Interactive Commons (IC), which curates novel, cross-functional collaborations and harnesses technology to gather, process and visualize information to promote understanding and exchange.

<u>*Short:*</u> NORTECH Inventor of the Year 2015, Magnetic Resonance Fingerprinting (MRF) creator, Microsoft HoloLens collaborator, Interactive Commons (IC) Director

Jones, Andy

Director of Science at the Cleveland Museum of Natural History, William A. and Nancy R. Klamm Endowed Chair of Ornithology, Dr. Jones is an expert at applying genetics and comparatve phylogeography among a variety of other methods. His conservation and biodiversity research foci include habitat changes during and after the last ice age.

<u>*Short:*</u> Ornithologist, expert on biodiversity; Director of Science at the Cleveland Museum of Natural History

Kahn, Laura

Fellow of the American College of Physicians, research scholar with the Program on at the Woodrow Wilson School of Public and International Affairs, Princeton University and organizer of the Carnegie Corporation-sponsored biodefense seminar series, Dr Kahn is author of the popular book, Who's In Charge? Leadership during Epidemics, Bioterror Attacks, and Other Public Health Crises. A strong advocate of the One-Health Initiative linking human and animal health, she is an expert on antibiotic resistance in food and medicine. Her second book, "One Health and the Politics of Antimicrobial Resistance," will be published in August.

Short: Author; Expert on biodefense at Princeton's Program in Science and Global Security

Karn, Jonathan

Director of the Case Center for AIDS Research, Chair and Reinberger Professor of Molecular Biology at Case Western Reserve University, Dr Karn's pivotal work has been on control of gene expression and latency in HIV, and strategies for viral eradication. He has authored more than 100 scientific papers on viruses.

Short: Expert on gene expression in viruses, Director of the Case Center for AIDS Research

LaManna, Joe

The Jeannette M. and Joseph S. Silber Professor at Case Western Reserve University, Dr. LaManna's primary research focus is Cerebral angiogenesis, blood flow & metabolism based on the study of the molecular mechanisms that regulate capillary structure and function as a component of the neurovascular unit. His group focuses on genes involved in the formation of new blood vessels in response to lack of oxygen, and the process of angioplasticity. The laboratory also investigates the brain metabolism of ketones as an alternate fuel to glucose, using low-carb diets as a potential strategy for treatment of neurodegenerative diseases.

Short: Expert on the brain, stroke, metabolism, aging and diet. Silber Professor of Brain Sciences.

Princehouse, Patricia

4-H champion to Harvard PhD, Ohio native Dr Princehouse was always fascinated by evolution. Director of America's first major in Origins Sciences, and Outreach Director of the Institute for the Science of Origins, her interests extend also to the emergence and evolution of artificial life and she won the 2003 "Friend of Darwin" Award for safeguarding the integrity of public school science education in Ohio. She breeds Pyrenean Shepherds and Great Pyrenees for practical farm work as well as competition performance sports.

Short: Evolutionary biologist; Outreach Director of Institute for the Science of Origins; Co-Organizer of Real Science Now

Rich, Jeremy

Chair of Stem Cell Biology and Regenerative Medicine at the Lerner Research Institute of the Cleveland Clinic, Dr. Rich is a renowned researcher who investigates cancer stem cells in brain tumors and novel treatments aimed at slowing brain tumor growth.

Short: Expert on stem cells, Chair at Lerner Research Institiute

Rissing, Steve

International expert on the evolution and ecology of cooperation, Dr Rissing's pioneering work on group selection earned the cover of Nature magazine. Former director of the Ohio State University's Introductory Biology Program, he is a research scientist with a passion for unlocking the secrets of effective science communication. Through his focus on evolution and undergraduates, his longstanding science column in the Columbus Dispatch, and his interest in the application of evolutionary science insights in public policy formation, his unique brand of understanding co-evolutionary processes is in demand today, and nowhere more urgently than in using the predictive power of evolution to forecast the dynamics of virus eruptions like Flu, Ebola, and Zika.

Short: Evolutionary biologist and ecologist, expert on coevolution, entomology, science education

Savinell, Robert

Prominent authority on electrochemical energy storage and conversion, with seven electrochemical patents, Dr Savinell went from Diamond Shamrock to become the George S. Dively Professor of Engineering at Case Western Reserve University. His work is directed at fundamental science and engineering research for electrochemical systems and novel device design, development, and optimization. His interests include batteries, electrolysis, fuel cells, supercapacitors, and water treatment. He and Morton Litt of CWRU hold a patent for the PBI/acid polymer electrolyte, the first system capable of practical proton conductivity at temperatures above 100°C with low relative humidity. This ground-breaking work has provided the inspiration for world-wide activity in developing high temperature polymer electrolytes, and has been licensed to several large multi-national corporations. He is currently developing new very large scale electrochemical energy storage systems for utility and renewable energy sources.

Short: Expert on high tech batteries, fuel cells, and new very large scale electrochemical energy storage systems

Singer, Lynn

Deputy Provost of CWRU, Chair of the National Institutes of Health Center for Scientific Review Committee on Child Psychopathology and Developmental Disabilities, and Chair of the Steering Committee for the International Center for Autism Research and Education (ICARE), Dr. Lynn Singer is a professor of epidemiology & biostatistics, pediatrics, psychiatry and psychology, and has directed numerous multi-million dollar grants that follow high-risk infants, including preterm infants with lung disease and a longitudinal study of cocaine-exposed infants now in its third decade.

Short: Deputy Provost of CWRU, Expert on high-risk infants and developmentally- and environmentally-mediated illnesses

Simpson, Scott

Director of the Galili Paleoanthropological Project in Ethiopia, Dr. Simpson has 25 years of experience discovering and describing a number of our earliest human ancestors recovered from the ancient deposits in the Afar region of Ethiopia. These ancient species include the wide-spread one million year old (Ma) species Homo erectus, the enigmatic 2.5 Ma Australopithecus garhi, the well-known 3.2 Ma 'Lucy' species (Australopithecus afarensis), the earliest ancestor to walk on two legs – the 4.4 Ma Ardipithecus ramidus, and some of the earliest human ancestors yet discovered including the 5.6 Ma Ardipithecus kadabba, and specimens dated to over 6 million years in age. These fossils highlight the unexpectedly diverse, complex, and very interesting evolutionary history of our lineage that provides insight into our changing behaviors and dynamic environmental interactions that has resulted in our technologically sophisticated and symbolically adept species – Homo sapiens. Dr. Simpson is a Professor at Case Western Reserve University School of Medicine's Department of Anatomy and holds a research appointment in the Laboratory of Physical Anthropology at the Cleveland Museum of Natural History. His research has also illuminated the obstetrics of Homo erectus.

Short: Paleoanthropologist, expert on "Lucy" and other hominin fossils

Spergel, David

A MacArthur Fellow, Dr. Spergel is founding director of the new Simons Foundation Center for Computational Astrophysics (CCA) in Manhattan, and Charles A. Young Professor of Astronomy on the Class of 1897 Foundation and past chair of Astrophysical Sciences at Princeton University. An originator of the Wilkinson Microwave Anisotropy Probe (WMAP) mission and spacecraft, he shared the 2015 Heineman Prize for "investigation of the fluctuations of the cosmic microwave background that have led to major breakthroughs in our understanding of the universe". A member of the National Academy of Sciences, Dr. Spergel currently chairs the Academy's Space Studies Board.

Short: Astrophysicist at Princeton; WMAP mission and spacecraft developer

Starkman, Glenn

Director of the Institute for the Science of Origins, Professor of Physics and Astronomy at Case Western Reserve University and distinguished alumnus of the University of Toronto and Stanford University. Dr. Starkman and colleagues developed a novel explanation for Dark Matter and recently was part of the team that performed the first numerical model of cosmology using General Relativity with all of its complexity. When he isn't searching for evidence of non-trivial universal topology and studying differences between General Relativity and modified theories of gravity, he's investigating the future of life and thought in the universe. Director/Organizer of Real Science Now

Short: Astrophysicist at Case Western Reserve University; Director of the Institute for the Science of Origins; Director/Organizer of Real Science Now

Strangi, Giuseppe

Extremely tiny machines come from Dr. Strangi's Nanoplasm Lab, which develops extreme optics and plasmonics of photonic metamaterials, a new class of artificially engineered nanostructures with extraordinary physical properties. Ohio Research Scholar Endowed Chair and Professor of Physics at Case Western Reserve University, Dr Strangi is driven to learn from nature how to create materials with life applications without threatening the life, without harming the environment and by exploring natural strategies in the framework of the scientific initiative "From Life to Life".

Short: Director, Nanoplasm Lab; Ohio Research Scholar Endowed Chair who artificially engineers nanostructures