

CASW Council for the
Advancement
of Science Writing

Fifty-Second Annual Briefing

New Horizons in Science

HOSTED BY THE OHIO STATE UNIVERSITY



PART OF

ScienceWriters2014

COLUMBUS, OHIO OCTOBER 17–21, 2014

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Friday, October 17

11 a.m. – 5 p.m.	NASW Board Meeting , Hayden Room
noon – 6 p.m.	Check-In , Hilton Main Lobby
1 – 4 p.m.	Data crunching and visualization hands-on workshop King Room
1 – 4 p.m.	Podcasting hands-on workshop , Hopkins Room
6 – 9 p.m.	Ohio State welcome reception The Drake Performance and Event Center, Ohio State campus Buses depart from Hilton
8:30 – 11 p.m.	Culture Dish diversity mixer Barley's Brewing Company 467 N. High Street (a short walk from Hilton)

Saturday, October 18

7:30 a.m. – 5:30 p.m.	Check-In , Hilton Lower Level
8 a.m. – 5:15 p.m.	National Association of Science Writers meeting and workshops , Hilton Lower Level and Lobby Level
5:45 – 9:30 p.m.	Awards gala , COSI 333 W. Broad Street Buses depart from Hilton at 5:45



Sunday, October 19

New Horizons in Science

7 – 8:15 a.m.

Prefunction Area

Breakfast

8:15 – 9:30 a.m.

Bellows ABCD

Welcome and opening plenary

Guns, gender, race and violent video games:

Searching for the roots of modern aggression

Do violent video games and movies really induce aggressive behavior and fuel racial and gender stereotypes? Does the increase in gun violence in PG-13 movies harm children? These hotly debated questions have made Brad Bushman a lightning rod for controversy. Bushman's experiments suggest that playing a violent video game strengthens race and gender stereotypes as well as aggressive impulses. He is collaborating in several studies designed to tease out the mechanisms behind these influences and look at longer-term effects.

@BradJBushman

Brad J. Bushman

professor of communication and psychology

Margaret Hall and Robert Randal Rinehart Chair of Mass

Communication

The Ohio State University

9:30 – 10:30 a.m.

Bellows ABCD

Here comes CRISPR: The game-changing power of genome engineering

Four decades after the first direct manipulation of DNA by humans, genome engineering has suddenly become something you can do in your garage. The technology transforming the field is called CRISPR, for "clustered regularly interspaced short palindromic repeats." CRISPRs, scavenged DNA "spacers" that bacteria use to defend against viruses, are being harnessed in the lab as precise, efficient genome editors. CRISPR systems can be instructed to edit the genome of a human cell so as to silence, enhance or change a specific gene. George Church is calling for public discussion about

the ecological and ethical implications of this exploding technology while working on “gene drives” that could alter or eliminate whole populations of pests.

@geochurch

George M. Church

*professor of genetics, Harvard Medical School
director, PersonalGenomes.org
Harvard University*

10:30 – 11 a.m.

Break

10:30 a.m. – 12:30 p.m. Byrd Polar Research Center tour

Bus departs from Wall Street entrance and drops off at the Ohio Union for Lunch with a Scientist

11 a.m. – 12:15 p.m.

Concurrent sessions

Bellows ABCD

Navigating a minefield: Seeking and telling the truth about genetically modified crops

Scientists have been on the front lines of political and cultural strife over the safety and environmental effects of genetically modified crops. Research results are quickly spun into press releases by alarmists on one extreme and alliances of commercial interests and agricultural innovators on the other. Allison Snow is an ecologist who has worked for decades on the interaction between modified crops and weeds. At a time when new technologies could radically accelerate the applications of biotechnology, Snow worries about pressures to suppress discussion of certain issues and findings within the scientific community. The principles of good science and good journalism are needed at every scale from local to global. What do science writers need to know to navigate this minefield? Snow and colleague Carol Mallory-Smith, a weed scientist working on the front lines, will be joined by science writer Emily Waltz for a dialogue about the challenges for both science and science writing.

Science & Science

Writing panel

moderated by

Maggie Koerth-Baker

@maggiekb1

Carol Mallory-Smith

*professor of weed science
Oregon State University*

Allison Snow

*professor of evolution, ecology and organismal biology
The Ohio State University*

Emily Waltz

Freelance science writer

@emwaltz

Emerson Burkhart AB

Billions and billions of molecules: Exploring chemical space

Astronomers have nothing on Alán Aspuru-Guzik. His cosmos, the space of chemistry, is vast—populated by no fewer than 10^{60} possible molecules. Equipped with fast computers powered by principles of quantum chemistry and artificial intelligence, his lab conducts warp-speed searches for candidate molecules for energy and electronics. Earlier this year, after his team screened more than 10,000 quinone molecules, he joined colleagues in announcing a novel metal-free flow battery that might solve the grid storage problem for wind and solar energy. Such explorations of chemical space can also advance basic science, he maintains—answering questions as basic as “how come we’re made of this, and not that?”

@A_Aspuru_Guzik

Alán Aspuru-Guzik

*professor of chemistry and chemical biology
Harvard University*

12:15 – 2:15 p.m.

Lunch with a Scientist

Buses depart from Wall Street entrance

2:15 – 3:15 p.m.

2014 Patrusky Lecture

Bellows ABCD

The human evolutionary journey

As the storehouse of hominid fossils and information about the human genome continues to grow, our evolutionary journey appears to be more complicated than anticipated. Fossil hominid finds reaching back six million years have prompted significant redrawing of the human family tree. Donald Johanson and others have painted a picture of human origins with broad brushstrokes revealing who our ancestors were, where they lived, how they survived and what they contributed to modern *Homo sapiens*. Forty years after his discovery of the hominid Lucy prompted a redrawing of the human family tree, Johanson says three pillars of humanity make us who we are today: a unique communication system based on symbolic language, an unprecedented level of cooperation, and a capacity for cumulative culture. “The powerful interaction between biology and culture,” he says, “makes us the most creative, but at the same time the most destructive, species on Planet Earth.”

@DonaldJohanson4

Donald C. Johanson

*Virginia M. Ullman Chair in Human Origins
professor, School of Human Evolution and Social Change
founding director, Institute of Human Origins
Arizona State University*

3:15 – 3:30 p.m.

Break

3:15 – 5:15 p.m.

Olentangy River Wetland Research Park tour

Bus departs from Wall Street entrance

3:30 – 4:30 p.m.

Concurrent sessions

Bellows ABCD

Shaking the bird family tree

Now that genome sequencing allows scientists to paint an evolutionary portrait of large groups of species, Erich Jarvis says our view of the way many important traits evolved is about to change. Jarvis has focused his studies on the evolution of vocal learning in songbirds and humans—and through a careful examination of molecular pathways he's found that this ability has evolved several times. He will share insights from comparative genomic studies of a wide swath of the birds and their older relatives, the crocodilians, that are likely to upset conventional ideas about brain evolution and the avian family tree.

@erichjarvis

Erich Jarvis

*associate professor of neurobiology and HHMI Investigator
Duke Institute for Brain Sciences
Duke University*

Emerson Burkhardt AB

Personal transportation for sustainable megacities

For the first time in history, more people now live in cities than rural areas. Experts predict that the population of the developing world will continue to migrate to megacities, increasingly the centers for both economic growth and catastrophic problems in nations of the Asian Subcontinent and Latin America. Giorgio Rizzoni, who works on transportation issues around the globe, believes personal transportation systems will be a key to sustainability for the megacities of the future. Rizzoni is helping leaders of rapidly urbanizing countries develop the radical ideas for how personal transportation can enable people to live in megacities and solve problems of pollution, cost and energy consumption.

@1Rizzoni

Giorgio Rizzoni

*professor of mechanical and aerospace engineering and
electrical and computer engineering
director and senior fellow, Center for Automotive Research
Ford Motor Company Chair in Electromechanical Systems
The Ohio State University*

4:30 – 5:30 p.m.

Bellows ABCD

Concurrent sessions

Updating the HPV story: A cancer's shifting “behavioral genomics”

A decade ago, few doctors suspected that most head and neck cancers were caused by a virus—human papillomavirus or HPV, the same agent implicated in most cervical cancer. Maura Gillison, who brought the connection to light, has spent her career chasing one of the fastest-changing cancers on the planet. Through epidemiology and molecular sleuthing, she showed that the head and neck cancer oncologists were treating in 2000 was not the cancer they were treating 16 years earlier. The incidence of one kind of cancer, associated with tobacco use, had dropped by half, while HPV-positive cancers had more than doubled. Men now bear a heavier and growing burden of HPV illness than do women. To devise better treatment and public health campaigns, Gillison is now studying the links between human behavior and the genomics of these cancers and looking at the unusual ways the virus interacts with the host cell genome.

Maura Gillison

professor of medicine, epidemiology and otolaryngology

Division of Medical Oncology

Jeg Coughlin Chair of Cancer Research

OSU Comprehensive Cancer Center

The Ohio State University

Emerson Burkhart AB

The long-awaited dawn of neutrino astronomy

Last year, while the physics community was still talking about the 2012 discovery of the Higgs boson, a quiet discovery was made deep under the ice of Antarctica. IceCube, a vast telescope made of photomultipliers embedded in ice, had detected the first neutrinos from deep space. It was the dawn of a new era in astronomy in which electromagnetic radiation is no longer the only means of probing the distant universe. John Beacom, a theorist helping design the new detectors, says the famously ephemeral neutrino can allow direct observations that can't be made by detecting light, which is emitted from the exteriors of astrophysical objects. Neutrinos uniquely probe these objects' central power sources and bring us information nearly unaffected by their travel through huge densities to the surface. Already neutrinos have mapped the core temperature of the sun, announced the birth of a nearby supernova and provided a skymap of the high-energy universe.

Soon to come are first discoveries about distant supernovae and ultra-high-energy cosmic rays.

John Beacom

professor of physics and astronomy

director, Center for Cosmology and AstroParticle Physics

The Ohio State University

7 – 10 p.m.

Barley's Brewing

Company

467 N. High Street

ScienceWriters party

Have “tea with a scientist”

Before heading off to the party at Barley's, enjoy a break with speakers and colleagues and use your drink ticket in the Hilton's Gallerie Bar.



Monday, October 20

7 – 8:30 a.m.

Prefunction Area

Breakfast

8:30 – 9:30 a.m.

Bellows ABCD

El Niño and human history: The record written in tropical glaciers

What role does environment play in human history? We know about earthquakes, floods and similar catastrophes, but the influences of global climate on human civilization are harder to tease from the evidence. In 2013, Lonnie Thompson and Ellen Mosley-Thompson announced an analysis of two tropical ice cores extracted from Peru's Quelccaya Ice Cap. This record, which they called a “Rosetta Stone” of climate history, was so detailed that they could discern annual variations in temperature, precipitation and atmospheric chemistry over the past 14 centuries. They are now examining the interplay

among droughts, El Niño oscillations and human history associated with the unusual events recorded at Quelccaya and a glacier atop the Himalayas. These cores contain evidence of “Black Swan” events corresponding to devastating population disruptions that may have been climate-related. Understanding the characteristics and causes of such events is critical for designing adaptive measures in a world with unprecedented population and anthropogenic influences on climate.

@ByrdPolar

Ellen Mosley-Thompson

*professor of geography
Distinguished University Professor
director, Byrd Polar Research Center*

Lonnie Thompson

*Distinguished University Professor
senior research scientist, Byrd Polar Research Center
The Ohio State University*

9:30 – 10:30 a.m.

Bellows ABCD

Concurrent sessions

Metabolism: A new link between marital stress, depression and health

When psychologist Jan Kiecolt-Glaser encountered nutritional studies showing that high-fat meals can cause inflammation, she wondered what might happen if you added stress to the equation. Now a series of experiments suggests that marital stress and clinical depression can affect health in ways never before studied. Martha Belury, who studies cancer and nutrition, is one of the collaborators who have joined Kiecolt-Glaser in looking at metabolic links that may be important in assessing risk for obesity, diabetes and cardiovascular disease.

Martha Belury

Carol S. Kennedy professor of nutrition

Janice Kiecolt-Glaser

*professor of psychiatry and psychology
Distinguished University Professor
The Ohio State University*

Emerson Burkhardt AB

Beyond graphene: Tunable one-atom-thick materials for tomorrow's technology

If you haven't kept a close eye on the fast-moving field of solid-state materials, you might not realize that novel carbon-based electronic materials such as nanotubes and graphene are already yesterday's news. While some groups look for ways to overcome the limitations

of these fascinating materials, Josh Goldberger's lab is moving down the periodic table to create exotic single-atom-thick materials from germanium ("germanane") and tin ("stannanane") and build extraordinarily tiny transistors from them. They hope that these materials will conduct electric current without dissipation while being stable and switchable, enabling the next-generation electronics needed for faster, energy-stingy computing.

Josh Goldberger

*assistant professor of chemistry
The Ohio State University*

10:30 – 11 a.m.

Break

11 a.m. – noon

Concurrent sessions

Bellows ABCD

Coyotes in the Loop: A close-up view of survival in the urban core

The "ghosts of the Plains" are fast becoming shadowy denizens of downtown. Stan Gehrt has been tracking Chicago's urban coyote population for a decade and is now getting answers to some of their great mysteries, thanks to GPS collars, wearable night-vision cameras and stable-isotope analysis of coyote whiskers. Coyotes thrive in the city, where food is abundant and where the automobile, which they study closely and deftly avoid, is their only threat. Downtown Chicago is providing a laboratory for study of the largest predator to successfully exploit and colonize the urban core, yielding valuable insight to guide urban wildlife management.

Stan Gehrt

*associate professor of wildlife ecology
extension wildlife specialist
The Ohio State University*

Emerson Burkhart AB

Not just flocking: "Active matter" studies aim to understand wound healing, metastasis

Penguins huddle, wounds heal, mosh pits writhe. Bring together a collection of self-propelled individuals, and you've got "active matter"—collective behavior that produces unusual patterns and drives many of the processes important to life. Once, physicists studied non-equilibrium behavior and phase transitions by supplying energy to a system and observing how it was transduced from large to small scales. Today Cristina Marchetti and others, extending a two-decade-old area of theory that began with bird flocking, study systems where the energy of individuals

Monday, October 20

leads to large-scale organization. They are making progress in understanding the mechanical processes that drive cell motion and underlie phenomena from wound healing to metastasis.

Cristina Marchetti

*William R. Kenan, Jr., Professor of physics
Syracuse University*

noon – 1 p.m.

Bellows EF

Lunch

1 – 3 p.m.

Sports Health & Performance Institute tour

Bus departs from Wall Street entrance

1 – 2 p.m.

Bellows ABCD

BICEP2: Strong support for inflationary cosmology, or a cloud of dust?

The cosmology community was set abuzz early this year when the BICEP2 collaboration announced that their South Pole telescope had detected the imprint of gravitational waves from the early universe. BICEP2 seemed to have peered through the cosmic microwave background radiation to the first moments of the universe, its observations giving a significant boost to the inflationary theory of the big bang. Then questions began coming: Had the astronomers properly accounted for galactic dust? Could dust produce the same patterns? A September paper from the Planck space observatory group provided a partial answer, and now the two teams are collaborating. Cosmologist Marc Kamionkowski is one of many theorists who momentarily set aside other projects to scrutinize the BICEP2 results and ensuing debate. Whether or not the initial finding holds up, he says, the debate has been “interesting and instructive. We’re seeing knowledge made, and the science is really cool.”

Marc Kamionkowski

*professor of physics and astronomy
The Johns Hopkins University*

2 – 2:30 p.m.

Bellows ABCD

Lessons in the communication of science from the BICEP2 story

This follow-up discussion will take a look at lessons learned by scientists and science writers involved with the BICEP2 story, which inspired wide Nobel speculation and looked like it might be the science discovery of the century when the results were released March 17, well ahead of planned publication in June.

**Science & Science
Writing panel
moderated by
Matthew Francis**

The story inspired broad speculation about the true nature of the universe and sparked rumors about spurious results. Was this an example of the perils of press-conference science, or a chance to help the public understand how science really works?

@DrMRFrancis

Matthew Francis

freelance science writer

Marc Kamionkowski

professor of physics and astronomy

The Johns Hopkins University

@betsymason

Betsy Mason

science editor

WIRED.com

2:30 – 3 p.m.

Break

2:30 – 5 p.m.

Center for Automotive Research/Driving Simulation Lab tour

Bus departs from Wall Street entrance

3 – 4 p.m.

Bellows ABCD

Progress toward targeted cancer therapies: A new role for microRNA

In 2001, imatinib (Gleevec) was hailed as one of the first “bullet” treatments for cancer: a targeted therapy that successfully disrupted a molecular pathway involved in tumor growth. Are there more targeted therapies on the horizon? Carlo Croce, one of the scientists whose work drives development of such drugs, is optimistic. Croce showed in 2002 that the molecular pathways to cancer all involve dysregulation of microRNAs—small noncoding RNA molecules now known to be important in the regulation of gene expression. Recently his lab found that microRNAs can transmit a signal that promotes remote tumor development or can act directly as hormones to induce cell death. This has led to a new hypothesis about cachexia, the muscle wasting that makes late-stage lung and pancreatic cancers untreatable, and proposals for targeted therapy to prevent the death of muscle cells so these patients can be treated.

Carlo Croce

Distinguished University Professor

chair, Department of Molecular Virology, Immunology and Medical Genetics

director, Human Cancer Genetics Program

director, OSU Comprehensive Cancer Center

The Ohio State University

Monday, October 20

4 – 5 p.m.

Bellows ABCD

Prediction, perception and how we shape memory

How do we remember? In Per Sederberg's view, the brain is a prediction machine: It carries around representations of the world, stores associations between those representations and then dynamically changes them with experience. The stored context developed through experience informs the predictions we continue to make as we move through life; these predictions shape our perception, learning and subsequent memories and may even create our personality. This model enables Sederberg to study "memory in the real world," rather than asking subjects to simply recall word lists, and to look for clues to Alzheimer's disease and the broader dynamics of cognitive decline. New Horizons in Science attendees will learn early results of an on-the-spot study of cognition by Sederberg's Computational Memory Lab.

Per Sederberg

assistant professor of psychology

associate director, Center for Cognitive and Brain Sciences

The Ohio State University

6 – 8:30 p.m.

Short North dine around

Tuesday, October 20

All buses depart from Wall Street entrance

7:30 a.m. – 4 p.m.

The Wilds tour

9 – 11 a.m.

Byrd Polar Research Center tour

Cartoon Library and Museum tour

9:45 – 11:45 a.m.

The James Cancer Hospital tour



New Horizons in Science



Alán Aspuru-Guzik

*professor of chemistry and chemical biology
Harvard University*

Alán Aspuru-Guzik works at the interface of quantum information and chemistry and harnesses large-scale computation for discovering molecules that will enable critical advances in technology. In particular, he is interested in the use of quantum computers and dedicated quantum simulators for chemical systems. He and his group recently developed a density functional theory for open quantum systems. He also leads the Clean Energy Project, a distributed computing effort for screening renewable energy materials. A graduate of the National Autonomous University of Mexico (UNAM), Aspuru-Guzik launched his faculty career at Harvard in 2006 after earning his PhD and conducting postdoctoral research at the University of California, Berkeley. He has received a number of awards for research and teaching and in 2010 was selected as a Top Innovator Under 35 by MIT's *Technology Review*. In 2012, he was elected a fellow of the American Physical Society and received the ACS Early Career Award in Theoretical Chemistry.

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John Beacom

*professor of physics and astronomy
director, Center for Cosmology and AstroParticle Physics
The Ohio State University*

John Beacom has been at Ohio State since 2004 and was named professor in 2010. The fundamental goal of his work is to help turn “neutrino astronomy” from an oxymoron into an observational science and to develop its theoretical consequences. His research spans neutrinos, supernovae, high-energy astrophysics and dark matter, and frequently connects theory to experiment and observation and physics to astronomy. His research, teaching and service has been recognized by a National Science Foundation CAREER award and Fellowship in the American Physical Society, two

2014 Speakers: Scientists

major teaching awards from OSU and an Outstanding Referee Award from the APS. He is currently Chair of the APS Division of Astrophysics.

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Martha Belury

*Carol S. Kennedy professor of nutrition
The Ohio State University*

Martha Ann Belury earned her PhD in biological sciences from the University of Texas at Austin, specializing in carcinogenesis. Her research seeks to identify dietary components that prevent carcinogenesis. Compounds that she evaluates include dietary fatty acids and flavonoids, a diverse group of bioactives that affect energy metabolism and inflammation. Her research has resulted in more than 90 research articles and funding support from a variety of agencies (NIH, USDA, NASA), private organizations (American Cancer Society, American Institute for Cancer Research) and for-profit companies. Belury serves on the editorial boards of *Lipids*, the journal of the American Oil Chemists Society, and *Molecular Nutrition and Food Research*. She was recently honored as having published the 17th most cited paper in the 70-year history of *Nutrition Reviews* and is a Fellow of the American Association for the Advancement of Science.

people.ehe.osu.edu/mbelury/ • belury.1@osu.edu



Brad J. Bushman

*professor of communication and psychology; Margaret Hall and
Robert Randal Rinehart Chair of Mass Communication
The Ohio State University*

For about 30 years, Brad Bushman has studied the factors that cause human aggression, including violent media. He has published more than 160 peer-reviewed journal articles and conducted more than 50 studies on violent media effects. His research has challenged several myths (for example, that violent media have a trivial effect on aggression, venting anger reduces aggression, violent people suffer from low self-esteem, violence and sex on TV sell products, and warning labels reduce audience size). One colleague calls him the “myth buster.” Bushman’s research has been featured extensively in the national and international media and earned him an Ig Nobel Award in 2013. He earned his Ph.D. in psychology at the University of Missouri and is also professor of communication science at the Vrije Universiteit Amsterdam.

@BradJBushman • www.comm.ohio-state.edu/bbushman • bushman.20@osu.edu



George M. Church

*professor of genetics; director, PersonalGenomes.org
Harvard Medical School*

George Church is a prolific, creative and entrepreneurial scientist and engineer whose work has repeatedly pushed forward the frontiers of genome science, bioengineering and synthetic biology. In his 1984 Harvard doctoral research, Church developed the first methods for direct genome sequencing, helping launch a “next generation” of technologies that eventually led to mapping of the human genome. This work also led directly to the first commercial genome sequence (for the human pathogen *H. pylori*) in 1994. His laboratory continues to develop genome-engineering technologies and is now leading experimentation with CRISPR. In addition, Church founded the Personal Genome Project in 2005 and directs PersonalGenomes.org, the world’s only open-access database of human genomic, environmental and trait data. His lab’s innovations have resulted in the founding of companies in medical diagnostics (Knome, Alacris, AbVitro and Pathogenica) and synthetic biology and therapeutics (Joule, Gen9, Editas, Egenesis, enEvolv and WarpDrive). Church has also been active in developing privacy, biosafety and biosecurity policy. He is director of the NIH Center for Excellence in Genomic Science. Elected to both the National Academy of Sciences and National Academy of Engineering, he has been awarded the Bower Award and Prize for Achievement in Science of the Franklin Institute. He has coauthored 330 papers, 60 patents and a popular 2012 book (with Ed Regis), *Regenesis: How Synthetic Biology Will Reinvent Nature and Ourselves*.

@geochurch • arep.med.harvard.edu/gmc • gmc@harvard.edu



Carlo Croce

*Distinguished University Professor and chair, Department of
Molecular Virology, Immunology and Medical Genetics
director, Human Cancer Genetics Program, and director,
OSU Comprehensive Cancer Center
The Ohio State University*

Carlo Croce is internationally renowned for his discoveries that cancer is a genetic disease and of the genes and molecular mechanisms involved in the development of leukemias, lymphomas and other cancers. In 2002 he discovered alterations in microRNA genes in human malignancies; he has since shown that microRNA dysregulation contributes to the development of tumors, discoveries that have led to innovative treatments based on gene-target discovery. Educated in biochemistry and medicine at the University of Rome “La Sapienza,” he began his career at the Wistar Institute in Philadelphia; he also held appointments at the University of Pennsylvania and Children’s Hospital of Philadelphia and later as director of the cancer research centers at both Temple University and Thomas

2014 Speakers: Scientists

Jefferson University. He moved to Ohio State in 2004 and now directs research in cancer genetics. A member of the National Academy of Sciences, the Institute of Medicine, the American Academy of Arts and Sciences and the Italian National Academy of Sciences, he has received copious honors in the US and Europe and has published more than 1,000 research papers. He is also professor of medical oncology at the University of Ferrara School of Medicine in Italy.

croce.5@osu.edu



Stanley Gehrt

*associate professor of wildlife ecology; extension wildlife specialist
The Ohio State University*

Wildlife biologist Stan Gehrt studies various aspects of mammalian ecology, especially urban systems and the dynamics of wildlife disease. He is principal investigator of the largest urban coyote study conducted to date, in which he has tracked more than 800 coyotes in the Chicago area for over a decade. He also studies coyote and deer ecology in Cleveland, Ohio, and has a collaborative project on the ecology of eastern coyotes in Cape Breton Highlands National Park, Nova Scotia. As an expert on human-coyote conflicts, Gehrt has consulted with cities across the US and Canada. His research has been featured in numerous print, radio and television outlets, including ABC, PBS, and the History and National Geographic channels. He is senior editor of the book *Urban Carnivores* (Johns Hopkins University Press, 2010). He earned his PhD at the University of Missouri studying the social organization of raccoons in south Texas. He joined the OSU faculty in 2003.

urbancoyotereseach.com • gehrt.1@osu.edu



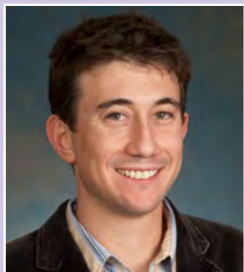
Maura Gillison

*professor of medicine, epidemiology and otolaryngology
Jeg Coughlin Chair of Cancer Research
The Ohio State University*

Maura Gillison is a medical oncologist and molecular epidemiologist. She was among the first scientists to establish an association between human papillomavirus infection and head and neck cancer. Her body of work has caused a paradigm shift in concepts of risk and management of head and neck cancer and has had significant implications for prevention, screening, diagnostics, prognostics and therapy. Gillison earned an MD and PhD at Johns Hopkins University before joining the Hopkins faculties in oncology, epidemiology and molecular microbiology and immunology. She was recruited to Ohio State in 2009 to occupy the Jeg Coughlin Chair of Cancer Research at the

OSU Comprehensive Cancer Center. Gillison has published extensively in journals including the *New England Journal of Medicine*, *Journal of the National Cancer Institute* and *Journal of Clinical Oncology*. She continues this work through broad collaborations spanning public health, oncology and genomic analysis.

www.oralcancerfoundation.org/research/ocf-researchers.php • Maura.Gillison@osumc.edu



Josh Goldberger

*assistant professor of chemistry
The Ohio State University*

After completing a bachelor's degree in chemistry at Ohio State, Josh Goldberger went to the University of California, Berkeley as an NSF graduate fellow and completed his PhD with Peidong Yang in 2006. Named an NIH-NRSA postdoctoral fellow, he worked with Professor Sam Stupp at Northwestern University's Institute for BioNanotechnology in Medicine. He has received many awards, including the IUPAC Prize for Young Chemists. Since joining the OSU Chemistry Department in 2010, he has been working on materials at the atomic scale.

research.chemistry.ohio-state.edu/goldberger • goldberger@chemistry.ohio-state.edu



Erich Jarvis

*associate professor of neurobiology and HHMI Investigator
Duke University*

Since turning down an audition with the Alvin Ailey Dance Theater to pursue science, Erich Jarvis has studied molecular pathways in avian brains as a window into how the brain controls complex behavior. He has proposed theories about the evolution of vocal production and learning in birds and how it relates to the origins of human language. A graduate of Hunter College, he earned his PhD in molecular neurobiology and animal behavior in 1995 at the Rockefeller University, where he did graduate and postdoctoral work in the lab of Fernando Nottebohm. Using a method he termed "behavioral molecular mapping" to determine how a bird's motor activities influence the resulting changes in gene expression in the brain, Jarvis has traced out the brain pathways for vocal learning in three distantly related birds—parrots, hummingbirds, and songbirds—and is now exploring evolutionary connections to understand how these pathways develop. Awards for his work include the NSF's Alan T. Waterman Award and the NIH Director's Pioneer Award; his work made *Discover's* top 100 science discoveries of 2005, and he was chosen one of *Popular Science's* Brilliant 10 of 2006.

[@erichjarvis](https://twitter.com/erichjarvis) • www.hhmi.org/scientists/erich-d-jarvis • jarvislab.net • jarvis@neuro.duke.edu

2014 Speakers: Scientists



Donald C. Johanson

2014 PATRUSKY LECTURER

*Virginia M. Ullman Chair in Human Origins; professor, School of Human Evolution and Social Change; founding director, Institute of Human Origins
Arizona State University*

Don Johanson fulfilled a childhood dream when in 1974 he earned his PhD in anthropology at the University of Chicago and joined Case Western Reserve University as a junior faculty member. That same year, on a search for hominid fossils at Hadar in the Afar Triangle of Ethiopia, Johanson found Lucy, the 3.2-million-year-old partial fossil skeleton that changed the conventional account of human evolution. Returning the following year, the group found the remains of at least 13 individuals that Johanson argued

were a new species, *Australopithecus afarensis*, a likely common ancestor to subsequent species of both *Australopithecus* and *Homo*. Johanson went on to found the Institute of Human Origins in Berkeley, Calif., in 1981 and directed IHO until 2009, moving it to Arizona State University in 1997. He has used the Lucy story extensively to excite and inform the public about human origins research. He has authored or co-authored several books, including *Lucy: The Beginnings of Humankind* (1991); *Ancestors: In Search of Human Origins* (1994); and *Lucy's Legacy: The Quest for Human Origins* (2010). His Webby-winning website www.becominghuman.org is used worldwide as a powerful learning tool. Today Johanson continues to conduct research at Hadar and teach at ASU. Recipient of many international prizes and awards, he is a Fellow of the Royal Geographical Society and a member of the Siena Academy of Sciences. With support from the National Science Foundation, the L. S. B. Leakey Foundation and the National Geographic Society, he has carried out field research in Yemen, Saudi Arabia, Egypt, Jordan and Tanzania as well as Ethiopia.

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Marc Kamionkowski

*professor of physics and astronomy
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Marc Kamionkowski is a theoretical physicist who specializes in cosmology. He earned his PhD in physics at the University of Chicago, followed by postdoctoral study at the Institute for Advanced Study in Princeton and faculty positions at Columbia University, where from 2006 to 2011 he was the Robinson Professor of Theoretical Physics and Astrophysics. In 2011

he joined the faculty at Johns Hopkins. Kamionkowski's most significant research

contributions are in the theory of dark matter, dark energy and the cosmic microwave background, but he has worked in other areas of astrophysics and early-universe and physical cosmology. Recent honors include the E. O. Lawrence Award for Physics (2006), an American Physical Society Fellowship (2008) and a Miller Visiting Research Professorship at Berkeley (2010). He was elected to the American Academy of Arts and Sciences in 2013 and in 2014 was named a Simons Foundation Investigator. Editor-in-chief and astrophysics and cosmology editor for *Physics Reports*, he has served as an editor of the *Journal of High Energy Physics* and the *Journal of Cosmology and Astroparticle Physics*. In addition to service on national committees and external advisory panels, he is a member and trustee at the Aspen Center for Physics.

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Janice Kiecolt-Glaser

professor of psychiatry and psychology
Distinguished University Professor
The Ohio State University

Janice Kiecolt-Glaser holds the S. Robert Davis Chair of Medicine at the Ohio State University College of Medicine and is a member of the OSU Institute for Behavioral Medicine Research. Her studies in psychoneuroimmunology have demonstrated important health consequences of stress, including slower wound healing, impaired vaccine responses, and accelerated inflammation. In addition, her programmatic work has focused on how personal relationships influence immune and endocrine function, and health. She is a member of the Institute of Medicine and a fellow of both the American Association for the Advancement of Science and the American Psychological Association. She has served on the editorial boards of 10 journals. Her research has been supported by a series of grants from the National Institutes of Health, including a MERIT award.

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Carol Mallory-Smith

professor of crop science
Oregon State University

Carol Mallory-Smith's research has focused on the problem of gene flow between crops and weeds, a problem that has slowed progress in agricultural biotechnology and raised environmental concerns. Her work has placed her in the middle of disputes involving growers, companies, activists and regulators in Oregon. A former English major, Mallory-Smith turned to botany and earned a PhD in plant science at the University of Idaho, joining the Oregon State faculty in 1994.

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She has been president of the Weed Science Society of America and chaired its Herbicide Resistance Committee.

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Cristina Marchetti

*William R. Kenan, Jr., Professor of physics
Syracuse University*

Cristina Marchetti is a theoretical physicist intrigued by the dynamics that govern the behavior of “active matter”—the myriad biological and physical systems, from flocks to superconducting vortices to living cells, that exhibit collective physical behavior. She has been a theorist in this field since coming to the US from Italy in 1978 to study “systems far from equilibrium” in her PhD research at the University of Florida. In 1987 she joined the faculty of Syracuse University, where she was awarded the Kenan professorship in 2005. Over the years she has convened conferences bringing together biologists, engineers, mathematicians and physicists to advance the theory of active matter. In early 2014 she was co-organizer of a four-month program on active systems at the Kavli Institute for Theoretical Physics (KITP) at UC Santa Barbara. Marchetti is a fellow of the American Physical Society and the AAAS and was awarded the 2013 Simons Foundation Fellowship in Theoretical Physics. She has served as chair of the Syracuse physics department and of KITP’s Advisory Board and Steering Committee and is currently associate director of the Syracuse Biomaterials Institute.

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Ellen Mosley-Thompson

*professor of geography and Distinguished University Professor
director, Byrd Polar Research Center
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Ellen Mosley-Thompson uses the chemical and physical information preserved in ice cores collected from the polar ice sheets and high mountain glaciers to reconstruct the Earth’s complex climate history. She has led nine expeditions to Antarctica and six to Greenland to retrieve ice cores. She served as the principal investigator and field team leader for the ice core drilling project on Bruce Plateau (Antarctic Peninsula) that was part of the US contribution to the International Polar Year. Areas of special interest include paleoclimatology, abrupt climate changes, glacier retreat, Holocene climate variability and contemporary climate change. She joined the Ohio State faculty in 1990 and became director of the Byrd Polar Research Center in 2009.

Mosley-Thompson is a member of the National Academy of Sciences, a member of the American Academy of Arts and Sciences and a fellow of the American Geophysical Union. She was awarded the Benjamin Franklin Medal in 2012.

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Giorgio Rizzoni

professor of mechanical and aerospace engineering and electrical and computer engineering

*director and senior fellow, Center for Automotive Research
Ford Motor Company Chair in Electromechanical Systems
The Ohio State University*

Giorgio Rizzoni received his undergraduate and graduate training in electrical and computer engineering at the University of Michigan and went on to conduct research as a postdoctoral fellow, assistant research scientist and lecturer at UM. He joined the OSU mechanical engineering faculty in 1990. He has held visiting positions at the University of Bologna, Italy, the Swiss Federal Polytechnic Institute (ETH) in Zürich and the Politecnico di Milano and Turin. Since 1999 he has been the director of the OSU Center for Automotive Research (CAR), an interdisciplinary university research center in the College of Engineering. CAR conducts research on advanced automotive and transportation technologies and systems engineering, focusing on sustainable, safe and intelligent mobility. Rizzoni's research interests are in system dynamics, measurement, control and fault diagnosis with application to automotive systems. He has a special interest in future ground vehicle propulsion systems, including advanced engines, electric and hybrid-electric drivetrains, and electrochemical energy storage and conversion systems.

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Per Sederberg

assistant professor of psychology

*associate director, Center for Cognitive and Brain Sciences
The Ohio State University*

Per Sederberg grew up in South Carolina as a child of four university professors (two English, two political science). Though always a big fan of computer programming, he went to the University of Virginia expecting to be a physics and math major. Per soon became fascinated with the brain and mind, and he switched his major to cognitive science, where it seemed every class he wanted to take counted toward the major. After working in both cognitive and computational neuroscience labs as an undergrad, he took four years off to work as a software developer before returning to graduate school at Brandeis University and the University of Pennsylvania

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to earn a PhD in neuroscience with a focus on electrophysiological and computational mechanisms of human memory. He went on to a postdoctoral fellowship at Princeton, where he studied machine-learning approaches to the analysis of neural data. In 2010 he joined the psychology faculty at Ohio State University, where he runs the OSU Computational Memory Lab.

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Allison Snow

*professor of evolution, ecology and organismal biology
The Ohio State University*

Allison Snow's Plant Population Ecology Lab studies natural selection and ecological processes within plant populations, including the dynamics of gene flow, especially involving transgenic plants. Trained as a plant ecologist at the University of Massachusetts, Snow received postdoctoral fellowships from the National Science Foundation and the Smithsonian Institution. Her current research combines molecular and ecological approaches to understand how quickly crop genes move into wild populations, and the extent to which novel transgenic traits could benefit weedy and semi-weedy plants. She is the lead author of a 2005 Ecological Society of America position paper on environmental effects of genetically engineered organisms. A Fellow of the American Association for the Advancement of Science and the Aldo Leopold Leadership Program and past president of the Botanical Society of America, she has served on the editorial boards of *Ecology*, *Ecological Monographs*, *Evolution* and *Environmental Biosafety Research*, on the US Department of Agriculture's National Genetic Resources Advisory Board and panels convened to discuss issues in transgenic organisms. In 2002, she was one of *Scientific American's* Top 50 Researchers in Science and Technology. She also directs the Undergraduate Research Office at Ohio State.

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Lonnie Thompson

*Distinguished University Professor; senior research scientist
Byrd Polar Research Center*

Lonnie Thompson is one of the world's foremost authorities on paleoclimatology and glaciology. He has led 60 expeditions during the last 40 years, conducting ice-core drilling programs in the polar regions as well as on tropical and subtropical ice fields in 16 countries including China, Peru, Russia, Tanzania and Papua, Indonesia (New Guinea). Thompson and his team were the first to develop lightweight solar-powered drilling equipment for the acquisition of histories

from ice fields in the high Andes of Peru and on Mount Kilimanjaro in Tanzania. The results from these ice-core-derived climate histories, published in more than 230 articles, have contributed greatly toward improved understanding of Earth's climate system, both past and present. Thompson is a member of the National Academy of Sciences and in 2007 was awarded the National Medal of Science. In 2013 he was awarded the International Science and Technology Cooperation Award of the People's Republic of China by the President of China, the highest honor given to a foreign scientist.

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2014 Speakers: Science Writers

Science & Science Writing panel moderators



Matthew Francis

Matthew R. Francis is a science writer, physicist, public speaker, educator, and frequent wearer of jaunty hats. He contributes a weekly column about astronomy and space to *The Daily Beast*. His writing has also appeared in *Ars Technica*, *Slate*, *Nautilus*, *Aeon*, and a variety of other publications. A former college professor and planetarium director, he holds a PhD in physics and astronomy from Rutgers University.

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Maggie Koerth-Baker

Maggie Koerth-Baker is a freelance science journalist and author and a member of the CASW Board of Directors. Currently a Nieman-Berkman Fellow at Harvard University, her work has appeared in *BoingBoing.net*, the *New York Times*, *New York Times Magazine*, *Discover* magazine, and more. She is the author of *Before the Lights Go Out*, a book about the electric grid and the future of energy. A column she wrote for the *New York Times Magazine* is included in the 2014 edition of *The Best American Science and Nature Writing*.

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2014 Speakers: Science Writers

Science & Science Writing panelists



Betsy Mason

Before becoming senior science editor for WIRED.com, Betsy Mason was an award-winning science reporter at the *Contra Costa Times* in the San Francisco Bay Area. She is a graduate of the Science Communication Program at UC Santa Cruz and has written about science for publications including *Nature*, *Science*, *Discover* and *New Scientist*. Before becoming a journalist, Betsy was a geologist, and she has a master's degree in geology from Stanford University and a bachelor's degree from Princeton. A member of the CASW Board of Directors, she is also the beer reporter for WIRED.com.

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Emily Waltz

Emily Waltz is a freelance science journalist specializing in biotechnology and the business of science. She writes frequently for *Nature Biotechnology*, where she has been a contributor for nine years. Her work has also appeared in *Nature*, *IEEE Spectrum*, *Scientific American*, *Discover* and *Mother Jones*. She regularly covers genetically modified crops, and has written features about the challenges faced by researchers and writers working in this field. Those stories can be found on her website, www.emilywaltz.com. See "Battlefield," "Under Wraps," "Tiptoeing Around Transgenics," and "Censorship of Science." Emily received a master's degree from Columbia University Graduate School of Journalism in New York City and a bachelor's degree from Vanderbilt University in Nashville, Tenn. She began her career in New York and now lives with her husband and two sons in Nashville. Emily can be contacted through her website.

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