A CELEBRATION OF FACULTY ACHIEVEMENT

Fall 2008
Each year, University of Colorado at Boulder faculty receive a wide range of awards, fellowships, and honors, from community service recognitions to national teaching honors to international research awards. Some, granted at the campus level, enable faculty to recognize their peers or students to honor their teachers. Others, such as the four Nobel Prizes or the seven MacArthur Fellow “genius grants” held by our colleagues, are the highest national and international recognitions granted to researchers, scholars, and artists.

To list all of the awards our faculty have received would require a hefty volume. This booklet contains a sampling of the many awards our faculty have received, including individuals who have become full professors, received tenure or campus fellowships, become CU-Boulder Distinguished Faculty or President’s Teaching Scholars, or gained membership in prestigious honorary academic societies.

We hope this booklet gives you a snapshot of our truly distinguished faculty—a community of scholars dedicated to educating their students, serving the greater good, and furthering the pursuit and dissemination of knowledge. Their efforts truly embody our strategic vision to redefine learning and discovery in a global context and to set new standards in education, research, scholarship, and creative work that will benefit Colorado and the world.

Philip P. DiStefano
Provost and Executive Vice Chancellor for Academic Affairs
Faculty Tenure and Promotion

Tenure Recipients
(effective August 2008)

Dennis Akos, Aerospace Engineering Sciences
John R. Black, Computer Science
Jason D. Boardman, Sociology
Scott G. Bruce, History
Geoffrey Cohen, Psychology
Alejandro Cremaschi, Music
Juan Pablo Dabove, Spanish and Portuguese
Elizabeth Dunn, Geography
Noah Finkelstein, Physics
Valerie Forman, English
Ryan T. Gill, Chemical and Biological Engineering
Bradley M. Goode, Music
Alexander Gorokhovsky, Mathematics
Melissa Hart, Law
John Jackson, Communication
José-Luis Jimenez, Chemistry and Biochemistry; Cooperative Institute for Research in Environmental Sciences
Jay Keister, Music
Daphne Leong, Music
Thea Lindquist, University Libraries
Margaret Winslow (Windy) Lundy, University Libraries
Jens Lykke-Andersen, Molecular, Cellular, and Developmental Biology
Cecile Matthey, French and Italian
Valerie K. Otero, Education
Scott E. Palo, Aerospace Engineering Sciences
Wounjhang Park, Electrical and Computer Engineering
Matthew J. Pranter, Geological Sciences
Douglas C. Sicker, Computer Science
Marcelo C. Sousa, Chemistry and Biochemistry
Matt Sponheimer, Anthropology
Leaf Van Boven, Psychology
Randall P. Walsh, Economics
Erik Willcutt, Psychology
Regan Zane, Electrical and Computer Engineering
Eric D. Zimmerman, Physics

Promotions to Full Professor
(effective August 2008)

James Austin, Music
Douglas Bamforth, Anthropology
Michael Brandemuehl, Civil, Environmental, and Architectural Engineering
J. Andrew Cowell, French and Italian; Linguistics
Charles De Bartolomé, Economics
Toby Hankin, Theatre and Dance
Mark T. Hernandez, Civil, Environmental, and Architectural Engineering
Keith Julien, Applied Mathematics
Wolfgang Keller, Economics
Jana Milford, Mechanical Engineering
Randall C. O’Reilly, Psychology
Scott Parker, Physics
Brenda Schick, Speech, Language, and Hearing Sciences
Robert L. Spencer, Psychology
Bryan Taylor, Communication
Luis Valdovino, Art and Art History
Deborah S. Wuttke, Chemistry and Biochemistry
The University of Colorado extends the title of “distinguished professor” to recognize the outstanding contributions of faculty members to their academic disciplines. This title signifies a select group of faculty members who are leaders in their respective fields as attested to by national or international recognition and/or their significant public service achievements.

2008 Recipients

**Kristi Anseth**  
*Chemical and Biological Engineering*

Less than 15 years into her professorial career, Professor Anseth embodies the best qualities of a distinguished professor. She is leading a team of faculty members and students that is developing degradable scaffolds, or frameworks, designed to help the body regenerate damaged tissues—such as knee cartilage—following injury or illness. A member of the prestigious American Association for the Advancement of Science, she was the first engineer to be named a Howard Hughes Medical Institute Investigator. Inside the classroom, Anseth has received consistent outstanding ratings from her students. She also frequently accompanies the chancellor and provost to visit prospective students and their parents. In 2004, she received the National Science Foundation’s highest honor for a young researcher, the Alan T. Waterman Award, and in 2003, she was honored with the American Society for Engineering Education’s Curtis W. McGraw Award, which is given each year to one faculty member under the age of 40 in recognition for contributions to both engineering education and research. Anseth received her doctorate in chemical engineering from CU-Boulder in 1994 and was a National Institutes of Health postdoctoral fellow at the Massachusetts Institute of Technology before joining the CU-Boulder faculty in 1996.

**Margaret Murnane**  
*Physics; JILA*

Professor Murnane, who joined the CU-Boulder faculty in 1999 after teaching in Washington and Michigan, is a world leader in the field of experimental ultrafast optical science—or cutting-edge laser research. Her research has resulted in new lasers that are now in use throughout the world for scientific, engineering, industrial, and medical purposes. Murnane leads a team of students that has achieved significant advancements in the field, such as generating X-ray beams that are enabling the development of a tabletop X-ray laser for super high-resolution medical imaging—making it easier for doctors to diagnose specific ailments at the microscopic level. Murnane has received a MacArthur Fellowship, also known as the "genius grant," is a member of the American Academy of Arts and Sciences, and in 2004 became the fourth woman elected to the National Academy of Sciences physics section. Outside the lab, Murnane is currently advising a highly multidisciplinary group of 16 doctoral students. She also dedicates her time to outreach efforts such as the popular “CU Wizards” community science education program and to improving the climate for women in science and engineering at the national level.
Norman Pace
Molecular, Cellular, and Developmental Biology

Professor Pace specializes in finding and identifying tiny bacteria and other microscopic life. An expert on ribonucleic acids, or RNA, he is one of the world’s leading authorities on life in deep-sea thermal vents and has applied his research group’s findings to challenges ranging from studies of human inflammatory diseases to potential life on other planets. His research efforts have led to new perspectives on microbial diversity, new molecular ecology research techniques, and new genetic research applications in microbial ecology. A member of the prestigious National Academy of Sciences and the American Academy of Microbiology, Pace also is a MacArthur Fellow. Beyond his research, Pace teaches both undergraduate and graduate courses and serves as the head of a committee to enhance and improve interaction among the life sciences departments at CU-Boulder. He came to the university in 1999 from the University of California, Berkeley, where he had already established his reputation as an authority on the evolution of primitive underwater life forms.
Faculty Fellowships Awarded

2008–09 Academic Year

Faculty Fellowships were created to acknowledge research excellence and to allow faculty to devote a year to research projects. The fellowships are highly competitive and are based on the applicant’s proposal, professional record, and the promise that the applicant’s research will result in significant contributions to academia and society.

**Fred Anderson**, Professor, History
**Virginia Anderson**, Professor, History
**Herbert H. Covert**, Professor, Anthropology
**John Crimaldi**, Associate Professor, Civil, Environmental, and Architectural Engineering
**William Ford**, Professor, Physics
**Ryan T. Gill**, Associate Professor, Chemical and Biological Engineering
**James C. Green**, Professor, Astrophysical and Planetary Sciences
**Alan Greenberg**, Professor, Mechanical Engineering
**Yuko Munakata**, Professor, Psychology
**Leo Radzihovsky**, Professor, Physics
**Harihar Rajaram**, Professor, Civil, Environmental, and Architectural Engineering
**Steve K. Schmidt**, Professor, Ecology and Evolutionary Biology
President’s Teaching Scholars at CU-Boulder

This program, established as a University of Colorado presidential initiative, is designed to honor and reward faculty who have excelled in teaching, scholarship, and research and to endorse teaching excellence throughout the university.

2008 Recipients

Diane Conlin
Associate Professor, Art and Art History; Classics

A member of the CU-Boulder faculty since 1998, Professor Conlin specializes in the art, architecture, and archaeology of ancient Rome. She is well known for her passion for Roman art, her gift for communicating that passion to her students, and her belief in their capabilities. She serves as co-director of the CU Excavations and Student Field School at the Villa of Maxentius in Rome, a project offered in collaboration with the Comune di Roma, where CU students can participate directly in an archaeological dig. Her book, *The Artists of the Ara Pacis: The Process of Hellenization in Roman Relief Sculpture*, won the Choice Outstanding Academic Book Award from the Association of College and Research Libraries and was a finalist for the James R. Wiseman Book Award from the Archaeological Institute of America. Professor Conlin is a fellow of the American Academy in Rome in classics. A 2008 Boulder Faculty Assembly Excellence in Teaching awardee (see page 21), she is respected by her colleagues as an outstanding lecturer, a model collaborator, and a dynamic teacher, and she has inspired countless students in her program through her expertise and keen intellect, combined with compassionate mentoring.

Stanley Deetz
Professor, Communication

As Director of the CU-Boulder Peace and Conflict Studies Center, Professor Deetz has energized an area of study deeply connected to the university’s efforts to engage students in service to the world. The author or editor of more than 10 books and roughly 100 articles, Deetz has a particular interest in areas of communication related to collaboration, democracy, stakeholder interaction, and personal identity. A highly respected classroom teacher and mentor, he played a large role in recent improvements to the communication department’s graduate program and undergraduate curriculum. He is a Fellow of the International Communication Association and received a Distinguished Scholar Award for lifetime achievement from the National Communication Association. In addition, he was chosen as a Senior Fulbright Scholar at Göteborgs Universitet in Sweden and has held visiting appointments at Arizona State University, the University of Texas, the University of Iowa, and the Copenhagen Business School. Prior to joining the CU faculty in 1997, Professor Deetz taught for several years at Rutgers University, chairing the department there during the 1980s.
President’s Teaching Scholars at CU-Boulder

**Steve Pollock**  
*Associate Professor, Physics*

Currently rated by students as among the very best of the distinguished physics faculty, Professor Pollock has consistently demonstrated excellence as a physics professor. In recognition of his stellar teaching record, he was awarded the Boulder Faculty Assembly’s Excellence in Teaching Award in 1998, the President’s Faculty Excellence Award for Advancing Teaching and Learning through Technology in 2004, and the University of Colorado “Best Should Teach” Award in 2006. He was also named a Pew-Carnegie National Teaching Scholar in 2001 and is a co-principal investigator for a $2.4 million National Science Foundation grant on a new model for teacher education in science and technology. Professor Pollock is known to spend many hours preparing for each class and to use new methods and technology—such as web-based homework and interactive “clickers” to assess student learning during lectures—as featured elements of his instruction. He also assists his colleagues in their teaching methods and supports the development of students into high-quality physics teachers through his work with the Science, Technology, Engineering, and Mathematics (STEM) grant—a program designed to recruit and train the next generation of K–12 math and science teachers—and the Colorado PhysTEC program.

**Elizabeth Robertson**  
*Professor, English*

As Director of the CU-Boulder Center for Medieval and Early Modern Studies, Professor Robertson is recognized for her demonstrated ability to show students why unfamiliar texts written centuries ago are still vital to the modern world—particularly when viewed through the lens of women’s issues. Among her many contributions since joining the English department in 1981, Robertson modernized the department’s graduate program curriculum and helped develop a nationwide community of scholars devoted to studies of medieval literature by women, for women, and about women’s issues—pushing the boundaries of what had previously been a relatively static field of study. Students consistently praise Robertson’s intellectual energy, generosity, and skill, as well as her profound dedication to her students. She received the Boulder Faculty Assembly Excellence in Teaching Award in 1993 and the Student Office of Alumni Relations’ Teaching Award in 2001. She was appointed a senior scholar in the Women’s Studies Program in 2003. Beyond CU, Professor Robertson also received a prestigious senior fellowship for university teachers from the National Endowment for the Humanities in 2004.
Active Scholars

Brian Argrow, Aerospace Engineering Sciences
Daniel Barth, Psychology
Martin Bickman, English
Douglas Burger, English
Lee V. Chambers, History
Anne Costain, Political Science
Alexander Cruz, Ecology and Evolutionary Biology
James H. Curry, Applied Mathematics
Michael Eisenberg, Computer Science
John L. Falconer, Chemical and Biological Engineering
Michael Grant, Ecology and Evolutionary Biology
Clayton Lewis, Computer Science
Ronald Melicher, Business
Wesley Morriston, Philosophy
James Palmer, Film Studies
Ed Rivers, English
Harvey Segur, Applied Mathematics
J. Michael Shull, Astrophysical and Planetary Sciences
James (Jim) Symons, Theatre and Dance
Dennis Van Gerven, Anthropology
Linda R. Watkins, Psychology
Marianne Wesson, Law
Carl Wieman, Physics; JILA
Shelby A. Wolf, Education

Retired Scholars

Jack Kelso, Anthropology
William Krantz, Chemical Engineering
Dale Meyer, Business
David M. Prescott, Molecular, Cellular, and Developmental Biology
Norton Steuben, Law
John R. Taylor, Physics
Klaus Timmerhaus, Chemical Engineering

Deceased Scholars

Nancy K. Hill, Humanities
Robert Pois, History
Hazel Barnes Prize

The $20,000 Hazel Barnes Prize is the largest single faculty award funded by the university. It was established in 1991 by former Chancellor James Corbridge in honor of philosophy Professor Emerita Hazel Barnes to recognize the enriching interrelationship between teaching and research.

John L. Falconer
Professor, Chemical and Biological Engineering

Professor Falconer is recognized for his groundbreaking research and his exceptional teaching record during 33 years on the CU-Boulder faculty. His research has emphasized new techniques to study surface chemical processes and reaction mechanisms—or new ways to separate chemical reactions into individual steps and learn more about the role catalysts play in the process. One recent collaboration with CU-Boulder Professor Richard Noble has led to significant breakthroughs in the development of membranes that can separate carbon dioxide and methane mixtures—a discovery that has great promise for reducing carbon emissions by removing carbon dioxide from natural gas without releasing it into the atmosphere. As the Melvin E. and Virginia M. Professor of Chemical and Biological Engineering, Falconer is well respected in his field, having published more than 200 papers in refereed journals, which together have been cited more than 5,000 times. He also has 11 patents on which he is a co-inventor and multiple papers about educational methods published in the journal Chemical Engineering Education. He has received research awards from the Colorado Section of the American Chemical Society and the Boulder Faculty Assembly, as well as three faculty fellowships from the University of Colorado Council on Research and Creative Work. In recognition of his outstanding work both in the laboratory and in the classroom, he was named a CU President’s Teaching Scholar in 2000, the university’s highest teaching recognition.
Robert Stearns Award

Given by the CU Alumni Association, the Robert Stearns Award recognizes faculty for outstanding teaching, extraordinary service, exemplary work with students, significant research, and off-campus service to the community.

Barbara Bintliff
Professor, Law

Professor Bintliff, Nicholas Rosenbaum Professor of Law and Director of the William A. Wise Law Library, is recognized for her long history of extraordinary contributions to the university. As one of the first women at CU-Boulder to hold an endowed chair, Bintliff’s career has been marked by many achievements since joining the faculty in the 1980s, including her election as chair of the Boulder Faculty Assembly, her selection as chair of the Boulder Athletics Board, and her service on the Chancellor’s Executive Committee and a Presidential Search Committee. Since becoming a law librarian, Bintliff has been active professionally in a number of areas. She has been involved as a leader, speaker, moderator, or panelist in numerous regional groups and national groups such as the Colorado Association of Law Libraries, the Association of American Law Schools, and the American Association of Law Libraries. In the meantime, she has also pursued scholarly interests, such as the differences between print and electronic information retrieval, the ways in which these search methods yield divergent results, and the implications of this variability both for individual arguments and for the development of the body of law. Professor Bintliff also explores issues of legal history and has published an article on the jurisdictional history of Colorado’s courts for the University of Colorado Law Review. Additionally, she serves on the editorial boards of several journals and contributes regularly to professional law literature through articles, reviews, and other publications.
Marvin Caruthers  
*Distinguished Professor, Chemistry and Biochemistry*

Professor Caruthers is recognized for his lifetime accomplishments as a chemistry professor, researcher, and biotechnology pioneer. He is a member of both the American Academy of Arts and Sciences and the National Academy of Sciences. His groundbreaking research in nucleic acid chemistry has led to new methods that are universally used for the chemical synthesis of DNA and RNA—one of the cornerstone technologies that has fueled the worldwide development of the multi-billion dollar biotechnology industry. In 1980, he co-founded two major biotechnology companies, including Applied Biosystems, which marketed “gene machines” based on his DNA synthesis methods, and Amgen, a California-based human therapeutics firm with more than 10,000 employees worldwide that operates drug-manufacturing plants in Longmont and Boulder, Colorado. Amgen is credited with developing blockbuster medicines used widely to treat anemia, rheumatoid arthritis, and cancer. In addition, he serves on the board of directors for Array Biopharma and Barofold and on the scientific advisory boards for Alphasniffer, Agilent, and Nanosphere Inc. Professor Caruthers holds multiple biotechnology patents. He is the past chairman of his department and serves on various college and university committees. A recipient of numerous prestigious scholarly awards, he became a Guggenheim Fellow in 1981, was named a CU Distinguished Professor in 1999, and received the National Medal of Science in 2006.

David Clough  
*Professor, Chemical and Biological Engineering*

Professor Clough has devoted his career to enhancing the learning of engineering students. He has pioneered active- and cooperative-learning techniques in the College of Engineering and Applied Science, and in 1989, he originated the concept of the university’s Integrated Teaching and Learning Laboratory—an innovative learning facility that has made CU-Boulder nationally known for its hands-on engineering curriculum. Known for his willingness to experiment with new educational concepts and technology, Clough has worked to reform traditional lecture classes into an interactive workshop format that greatly enhances the learning of students. Through all of his efforts, he has helped to reshape the way engineering is taught. The student-run Engineering Excellence Fund unanimously chose Clough as the first recipient of the Sullivan-Carlson Inspiration in Teaching Award in 1998. His students honored him with the American Institute of Chemical Engineers Undergraduate Teaching Award three times (1996, 1997, and 1998) and with the college’s Outstanding Advisor Award in 1993. He also has received the college’s Hutchinson Teaching Award and the Peters Service Award. He received the first Boulder Faculty Assembly Excellence in Teaching Award in 1980 and the Boulder Campus Outstanding Advisor Award in 1996. His merit as an educator is also recognized outside CU; in 1995, the American Society for Engineering Education (Rocky Mountain Section) presented him with its first Outstanding Educator Award. Professor Clough is in his third year as the University of Colorado’s Faculty Athletic Representative (FAR) to the Big 12 Conference, only the sixth FAR in CU history, and has been involved with student-athletes in the CU athletic department for over 25 years.
Alison M. Jaggar  
*Professor, Philosophy; Women and Gender Studies*

Professor Jaggar is recognized for her outstanding scholarship in contemporary social, moral, and political philosophy from a feminist perspective, including recent books that explore these topics such as *Just Methodologies: An Interdisciplinary Feminist Reader, Three Perspectives* (with Michael Tooley, Philip E. Devine and Celia Wolf-Devine), and the forthcoming *Pogge and his Critics*, an analysis of contemporary political philosopher Thomas Pogge's groundbreaking work on the subject of global justice. A prolific writer, Jaggar's additional scholarly interests include how to justify social criticism in contexts of inequality and cultural difference and gendered aspects of global justice. With these new lines of inquiry in mind, Jaggar is currently working on a co-authored book on the subject of ethics across borders and another book on global gender justice. Jaggar joined the CU-Boulder faculty in 1990, and she holds a joint appointment with the Department of Philosophy and the Women and Gender Studies Program.

Douglas R. Seals  
*Professor, Integrative Physiology*

Professor Seals's potentially life-changing research into "vascular aging," in particular the development of large artery stiffness and impaired arterial function with advancing age, holds great potential benefit to those who suffer from cardiovascular disease. His research team employs a wide range of contemporary experimental techniques to study these issues, focusing on the normal physiology of arteries and the forces at work in cases where arteries show signs of losing their ability to function properly. Professor Seals has been honored for his work with the National Institute on Aging's Research Career Development Award, the Herbert H. deVries Award for Distinguished Research in the Field of Aging, and the National Institute on Aging MERIT Award, among others. He is a fellow of the American Heart Association Councils on Basic Cardiovascular Sciences; High Blood Pressure Research; and Nutrition, Physical Activity, and Metabolism, and he has served in editorial leadership roles with the *Journal of Applied Physiology* and *Exercise and Sport Sciences Reviews*. In 2006, his work was honored with the Boulder Faculty Assembly Award for Research, Scholarly, and Creative Work.
Payson Sheets  
Professor, Anthropology

Professor Sheets has spent more than 20 years researching the ancient cultures of Central America—pursuing an interdisciplinary combination of archaeology, volcanology, biology, ethnography, and remote sensing that has led, for example, to the discovery of ancient footpaths and entryways in Costa Rica with significant implications to our understanding of ancient Native cultures. Sheets has been the principal investigator on a long series of National Science Foundation (NSF)-supported field expeditions, and he is currently writing a proposal for a three-year collaborative international research effort to explore the possible relationships between the footpaths and the entryways. In addition, he recently received an NSF grant for a spring 2009 field season at the Cerén site in El Salvador to excavate the magnificently preserved 16th-century fields and was also awarded an Innovative Research Grant from the CU-Boulder Graduate School in support of his future El Salvador research efforts. He is the author or editor of 10 books and has published dozens of papers.

J. Michael Shull  
Professor, Astrophysical and Planetary Sciences

Professor Shull’s extraordinary research spans three decades and includes theoretical and observational studies of space, quasars and black holes, galaxies, heavy elements and space molecules, and the first generations of stars. His recent projects include numerical simulations of the first galaxies and stars; how they form and evolve; and the impact of their radiation, gaseous outflows, and newly synthesized heavy elements. His research is supported by grants from NASA and the National Science Foundation, and from the Space Telescope Science Institute, the Far Ultraviolet Spectroscopic Explorer, and the Spitzer Science Center. Beyond his research, he has played an active role supervising many undergraduate research projects. One of his undergraduate students was recognized as the Outstanding Graduate of the College of Arts and Sciences for her 2005 honors thesis on infrared and ultraviolet studies of molecular hydrogen in space. Shull is a fellow in the Center for Astrophysics and Space Astronomy and an affiliated faculty member of the CU-Boulder Department of Applied Mathematics. He is also the chair of the Board of Directors for the Association of Universities for Research in Astronomy, which is currently working with NASA and the National Science Foundation to develop powerful new observational facilities for ground-based and space-borne astronomy.
Boulder Faculty Assembly Excellence in Teaching Award

Lawrence E. Carlson
Professor, Mechanical Engineering

Professor Carlson has been widely recognized as one of the finest teachers in the College of Engineering and Applied Science for many years. Carlson was recently honored by the National Academy of Engineering as a co-recipient of the 2008 Gordon Prize, the nation’s top award for innovation in engineering and technology education—recognition of his vision and leadership in co-establishing and directing CU-Boulder’s Integrated Teaching and Learning Program, which has helped make CU-Boulder a national model for experiential learning in engineering education. He also received the university’s Vince Konnny Award for Outstanding Undergraduate Advisor in 1990, the Council on Academic Advising Outstanding Undergraduate Advisor in 1990, the Charles Hutchinson Outstanding Teaching Award in 2001, and the John and Mercedes Peebles Innovation in Education Award in 2004. Students present an annual endowed award established in his name to a CU-Boulder engineering instructor, the Sullivan-Carlson Innovation in Education Award. Since joining CU in 1974, Professor Carlson has also established himself as a prolific researcher, with over 100 publications.

Diane Conlin
Associate Professor, Art and Art History; Classics

Professor Conlin continually strives to enrich the broader educational perspectives both within her academic departments and in the university community at large. Her exceptional range of course and curriculum development is a mark of her superior knowledge and her commitment to meeting the diverse needs of CU students. The excavation of the Villa of Maxentius in Rome demonstrates the breadth of Professor Conlin’s work, one of the reasons she was also named a 2008 University of Colorado President’s Teaching Scholar (see page 10). In all of her courses, students are challenged to better understand humanity’s age-old and ongoing struggle to make sense of our world. With a joint appointment in the Departments of Art and Art History and Classics, Professor Conlin teaches undergraduate survey courses in art history and classical archaeology and more advanced courses on the art and architecture of Rome and the Roman Empire.
Paul Gordon  
*Professor, Humanities*

Professor Gordon is one of the most revered teachers in the Department of Humanities. He is recognized for his ability to lead and simultaneously be an intimate part of his classes, a key reason that many of his students select humanities as a major after taking one of his classes. Beyond his outstanding work within the CU-Boulder academic community, Professor Gordon has also extended himself outside of CU’s boundaries, developing an innovative teaching collaboration with Dillard University, a historically Black college in New Orleans—an effort that received funding from the prestigious Carnegie Foundation in 2002. Gordon partnered with a Dillard faculty member to develop and deliver an introductory humanities course that made extensive use of technology, including online discussion boards, split-screen monitors, and simultaneous teleconferences of class meetings. This collaboration has been a resounding success, earning the trust, respect, and affection of students whose college and life experiences have benefited significantly as a result of his efforts.

Nii Armah Sowah  
*Instructor, Theatre and Dance*

Nii Armah Sowah’s teaching centers around creating community and building the future we wish to see. Sowah builds culture and community into his classroom in a manner that empowers, supports, and develops students. Sowah’s medium is dance, but his classes develop the whole student—mind, body, and spirit. He teaches students about respect, community, culture, and collective activity while celebrating individual capabilities and the world we inhabit. Sowah challenges students, and he expects them to realize their potential. He has contributed well beyond the dance classroom, expanding the dance curriculum dramatically, teaching in the College of Arts and Sciences Honors Program, and facilitating workshops in community building, diversity, and multicultural education. In addition, he has traveled the world, contributing his dance expertise on at least three continents, and he shares a global perspective with his students through efforts like an apprenticeship program that brings the culture of Ghana to the CU-Boulder campus. His classes encourage students to lead, support, and challenge each other to do their best, and he is recognized for the spirit of hard work, creativity, and reflection he consistently demonstrates in his teaching.
Boulder Faculty Assembly Excellence in Service Award

**Alan R. Greenberg**  
*Professor, Mechanical Engineering*

Professor Greenberg has established a strong record of quality service, even as he has also achieved an exceptionally productive research and teaching career as an expert in biomedical and materials engineering. He has served as the chair of the College of Engineering and Applied Science’s First Level Review Committee, as chair of the University Committee on Research Misconduct, and as chair of an internal review team for the Program Review Panel. Additionally, he has raised millions of dollars to support interdisciplinary research activity in the College of Engineering and Applied Science, has mentored more than 37 master’s and doctoral students, and has published well over 100 technical articles in first-line mechanical engineering journals. As executive director of the Membrane Applied Science and Technology (MAST) center, Professor Greenberg has also worked tirelessly to make the center a recognized leader in membrane science—the creation of films that can be used as air and water filters, biomedical materials, and in a variety of other applications—and a model program for other universities.

**Martha Hanna**  
*Professor, History*

A specialist in the history of modern France, Professor Hanna is respected, appreciated, and admired by her colleagues for her stellar service record and her remarkable ability to combine service with outstanding teaching and scholarship. Since joining the CU-Boulder faculty in the late 1980s, Hanna has been a devoted mentor to her students; has served on every history department standing committee; and has acted as the director of the undergraduate studies, graduate studies, and honors programs. She has also been elected multiple times to the department’s executive committee charged with personnel, policy, retention, and salary issues. Within the College of Arts and Sciences, she has also served on a variety of award, planning, conference, and prize committees. She served the campus as a whole when she chaired the Boulder Faculty Assembly’s ad-hoc committee on faculty course questionnaires. In addition to this recent award, Hanna received the Boulder Faculty Assembly Excellence in Teaching Award in 1993.
Alphonse Keasley
Director, Miramontes Arts and Sciences Program; Assistant Vice Chancellor for the Office of Diversity, Equity, and Community Engagement

Assistant Vice Chancellor Keasley has provided 34 years of outstanding and generous service to the CU-Boulder community. As director of the Miramontes Arts and Sciences Program (formerly the Minority Arts and Sciences Program), Keasley has played a central role in building an academic excellence community at CU-Boulder for students who wish to be part of a diverse group of scholars dedicated to academic achievement. Additionally, Keasley has contributed to the College of Arts and Sciences Honors Program, the Ronald E. McNair Post Baccalaureate Achievement Program for underrepresented students who wish to pursue graduate study (for which he wrote the original grant proposal), and the Leadership Certificate Program. He has held various CU-Boulder leadership responsibilities since 1996, including the CU Leadership, Excellence, Achievement, and Diversity (CU-LEAD) Alliance Management Team, the Enhancement for Undergraduate Education, the Honors Program Advisory Committee, and the Boulder Faculty Assembly. In addition to this award, Keasley has received several best teacher awards, the CU Alumni Association’s George Norlin Award, the University of Colorado Thomas Jefferson Award for outstanding service, and the Equity and Excellence Award for Leadership.

Michael L. Radelet
Chair and Professor, Sociology

A tireless advocate against the death penalty, Professor Radelet selflessly devotes his time and resources to speak to organizations and committees across the country who are exploring the elimination of the death penalty and to help victims of crimes. He also advocates for the parents of murdered children as a member of the Board of the Directors for the Families of Homicide Victims and Missing Persons in Colorado. Professor Radelet has served at all levels of the university. He joined the sociology faculty in 2001, first as associate chair and director of graduate studies, before taking on the reigns of chair of the department in 2003. As chair, his efforts have resulted in increased funding for graduate students and improved national visibility, a testament to his academic leadership. He has served on the College of Arts and Sciences Personnel Committee, on key bodies in the Office of the Vice Chancellor for Research, and on a university committee tasked with reforming personnel processes.
MJ

video.
multi-dimensional

Thriller (1982)
- "taste upgrade"
- older/younger

Madonna
**Boulder Faculty Assembly Excellence in Research, Scholarly, and Creative Work Award**

**John Bally**  
*Professor, Astrophysical and Planetary Sciences*

Professor Bally is an international leader in the burgeoning field of star formation. A CU faculty member since 1991, his research focuses on the impact new stars have on surrounding interstellar gases. Bally's work shows that newly formed stars are energetic events that influence their surroundings across many light-years of space. Bally has applied his expertise to the new field of astrobiology, examining physical conditions of stars and planetary systems in the harsh environments of star clusters. A leading authority on the Orion star cluster and the Orion molecular cloud, Bally has used the latest technology to map the distributions of gases and identify thousands of young stars buried within the Orion dark cloud. Bally and his colleagues have discovered thousands of star-forming sites in the inner regions of the Milky Way. These star-forming cores provide a treasure trove of data that highlights the great variety of stellar masses and types formed throughout our galaxy. In his work, Bally uses a wide variety of national telescopes and space observatories. His photographs and images from the Hubble Space Telescope are featured in many textbooks—including his own, *The Birth of Stars and Planets*—and in a National Geographic series on star formation. His astronomical images show how ionizing radiation and mass outflows from young stars produce physical and artistic evidence of these energetic phenomena.

**Victor M. Bright**  
*Professor, Mechanical Engineering*

Holding the Alvah and Harriet Hovlid Professorship in Mechanical Engineering, Professor Bright is recognized for his pioneering efforts in the design and process integration of microelectromechanical systems or, in other words, extending the life and reliability of tiny electric-powered devices. Bright's research spans many academic disciplines and strongly couples fundamental science with real-world goals, involving important aspects of materials science and engineering, fabrication, design, and electromechanical behavior of thin-film structures. Professor Bright's outstanding accomplishments have involved the mentoring of 24 doctoral and 22 master's students and the publication of hundreds of refereed journal articles and conference papers. His work has received national and international recognition, reflected in his editorship of the micromechanics section of the journal *Sensors and Actuators A: Physical* and many high-level technical society leadership positions. In addition to his own research and teaching pursuits, Professor Bright also currently serves as Associate Dean for Research for the College of Engineering and Applied Science.
Daniel K. Schwartz
Professor, Chemical and Biological Engineering

Professor Schwartz has made many innovative chemical and biological engineering contributions during his career, helping to build our knowledge of how molecules self-organize—or arrange themselves naturally, based on the conditions and forces the molecules are subject to—and using this knowledge in the creation of models for how a variety of microscopic living and non-living materials grow. Professor Schwartz and his research team have worked to bridge the gap between these fundamental scientific discoveries and how they can be used to improve applications such as vaccine formulations, memory chips, sensors, and medical diagnostic equipment. One of his contributions—proving the mechanism of self-assembled monolayer growth, or revealing the process through which some varieties of single-layered materials organize themselves—has become the standard model for the field. His research group is highly regarded for its creative use of experimental techniques to better understand ultra-thin molecular films, as well as its demonstrated ability to create self-assembling materials with desirable characteristics.

Phillip Solomon
Professor, Film Studies

Professor Solomon is widely regarded by students, fellow filmmakers, archivists, distinguished professors, and film critics as among the most personal, poetic, and visionary filmmakers in the country. Solomon’s films have found their way to New York’s Whitney Museum Biennials, three one-man shows at the Museum of Modern Art, five premieres at the New York Film Festival, six first prize awards at the Thomas Edison International Film Festival, dozens of international screenings from Amsterdam to Japan, and multiple purchases by museum and archival collections. There are layers upon layers of richness in a Solomon film. Professor Solomon once described his filmmaking to a CU colleague as “archeology in reverse.” His meditations on childhood, on loss, and on mortality are profound and powerful works of art. There is a paradox within the layers and rich textures of his films, for as they engage in the process of covering up, they also reveal a kind of X-ray of time that leads to discoveries and astonishments of the most personal and universal experiences.
Kayden Book Award

Named for Eugene M. Kayden, a 1912 CU-Boulder alumnus who went on to a distinguished career as a scholar and teacher of economics, the Kayden Book Award is open each year to CU-Boulder faculty in the humanities. Awardees receive a research stipend, and their department receives a grant to organize a one-day author-meets-critics symposium on their award-winning book.

Loriliai Biernacki
Associate Professor, Religious Studies

*Renowned Goddess of Desire: Women, Sex, and Speech in Tantra* examines the representations of women within the Hindu Tantric tradition. Drawing upon a body of little known Tantric texts from the fifteenth through the eighteenth centuries, Biernacki argues for a nuanced perspective of women in Tantra, presenting, for example, evidence for women’s enhanced status in some traditions of Tantra where women could serve as both guru and initiate. The book, written in an engaging and energetic style, takes up in particular the discourse structure of Tantric texts, examining how both women’s speech and their bodies are represented in interconnected ways. Professor Biernacki offers a rare combination of philological mastery and theoretical sophistication; she commands both Sanskrit and a range of other languages and post-modern theory, particularly feminist theory. The book provides basic scholarly materials—with appendices setting forth the historical context for the discussion, surveying images of women in Tantra, and summarizing the long and untranslated Bhannila Tantra, “The Great Blue Tantra”—and provides a striking new reading of this key cultural and religious tradition.

David Boonin
Chair and Associate Professor, Philosophy

In *The Problem of Punishment*, Boonin examines the problem of explaining why it is morally permissible for the state to treat those who break the law differently from those who do not. Boonin argues that there is no satisfactory solution to this problem and that the practice of legal punishment should therefore be abolished. Providing a detailed account of the nature of punishment and the problems that it generates, he offers a comprehensive and critical survey of the various solutions that have been offered to the problem and concludes by considering victim restitution as an alternative to punishment. Written in a clear and accessible style, *The Problem of Punishment* will be of interest to anyone looking for a critical introduction to the subject, as well as to experts in the field. Boonin is the author of the award-winning book *A Defense of Abortion*, as well as *Thomas Hobbes and the Science of Moral Virtue* and numerous articles on a variety of topics in ethics and applied ethics.

Kayden Book Award—Honorable Mention

*Attitude Problems*

Graeme Forbes, Professor, Philosophy
CU-Boulder Faculty Awards

Provost’s Faculty Achievement Awards

These annual awards are presented to selected faculty who have offered recent significant publication or creative contributions in their academic fields. Each awardee receives a research grant and a plaque recognizing their achievement.

Fall 2008

Assistant Professors

Dejan Filipovic, Electrical and Computer Engineering

Patrick Greaney, Germanic and Slavic Languages and Literatures

Gene Hayworth, University Libraries

Thomas M. Marchitto Jr., Geological Sciences; Institute of Arctic and Alpine Research

Will Medlin, Chemical and Biological Engineering

Associate Professors

Mathew Hayward, Business

Christine M. Hrenya, Chemical and Biological Engineering

Michael Huemer, Philosophy

Kamran Mohseni, Aerospace Engineering Sciences

Timothy Oakes, Geography

Cora Randall, Atmospheric and Oceanic Sciences; Laboratory for Atmospheric and Space Physics

Michael Theodore, Music
Additional Academic Achievements

Faculty at the University of Colorado at Boulder are awarded each year many honors and recognitions from beyond the campus. They range from the local to the international, and they honor the work of the faculty in teaching, research, and service. The following is a list of some of the most prestigious awards earned by our faculty and serves as a sample of the much larger list of recognitions garnered by our faculty.

American Academy of Arts and Sciences

The American Academy of Arts and Sciences is an international learned society composed of the world's leading scientists, scholars, artists, business people, and public leaders. The academy was founded in 1780. Members reflect the full range of disciplines, including mathematics, physical and biological sciences, medicine, social sciences and humanities, business, government, public affairs, and the arts.

- **Marvin Caruthers**, Chemistry and Biochemistry (1994)
- **Larry Gold**, Molecular, Cellular, and Developmental Biology (1993)
- **Deborah Jin**, Physics; JILA; National Institute of Standards and Technology (2007)
- **Carl Lineberger**, Chemistry and Biochemistry; JILA (1995)
- **Jane Menken**, Sociology; Institute of Behavioral Science (1990)
- **Josef Michl**, Chemistry and Biochemistry (1999)
- **Margaret Murnane**, Physics; JILA (2006)
- **Norman Pace**, Molecular, Cellular, and Developmental Biology (1991)
- **David Prescott**, Molecular, Cellular, and Developmental Biology (1970)
- **Wolfgang Schmidt**, Mathematics (1994)
- **Noboru Sueoka**, Molecular, Cellular, and Developmental Biology (1969)
- **Carl Wieman**, Physics; JILA (1998)
- **Gilbert White**, Geography (1969)
- **William B. Wood**, Molecular, Cellular, and Developmental Biology (1976)

National Academy of Education

The National Academy of Education advances the highest-quality education research and its use in policy formulation and practice. It consists of up to 150 U.S. members and 25 foreign associates who are elected on the basis of outstanding scholarship or outstanding contributions to education. Since its establishment, the academy has sponsored a variety of commissions and study panels that have published proceedings and reports.

- **Margaret Eisenhart**, Education (2004)
- **Lorrie Shepard**, Education (1992)
Additional Academic Achievements

National Academy of Engineering

The National Academy of Engineering includes more than 2,000 peer-elected senior professionals in business, academia, and government who are among the world’s most accomplished engineers, providing leadership and expertise for numerous projects focused on the relationships between engineering, technology, and the quality of life.

Bernard Amadei
Civil, Environmental, and Architectural Engineering (2008)

Professor Amadei has pioneered a new approach to engineering education by involving students in service-learning projects in the developing world, an effort that is helping to create globally responsible engineers and to provide sustainable and appropriate technology solutions to the endemic problems faced by developing communities worldwide. Engineers Without Borders-USA, which Amadei founded in 2000, has grown to include 14,000 student and professional members working on 250 sustainable engineering projects in 48 countries around the world. Amadei is also a recognized expert in geomechanics, the study of soil and rock behavior. He has co-authored a book on the subject and published more than 150 articles in peer-reviewed journals. Born in France, Amadei began his study of engineering there and in Toronto before earning his doctorate in civil engineering at the University of California, Berkeley in 1982. He then joined the faculty at CU-Boulder, where he has taught for 26 years. Amadei has won several other prestigious awards, including the Heinz Award for the Environment, the Hoover Medal, the Ralph Coats Roe Medal, and the Norm Augustine Award.

Other CU-Boulder Members

Frank Barnes, Electrical and Computer Engineering (2001)
Steve Clifford, Cooperative Institute for Research in Environmental Sciences (1997)
Ross Corotis, Civil, Environmental, and Architectural Engineering (2002)
Don Hearth, Aerospace Engineering Sciences (1989)
Martin Mikulas, Aerospace Engineering Sciences (1999)
Jacques Pankove, Electrical and Computer Engineering (1986)
Max Peters, Chemical and Biological Engineering (1969)
Valerian Tatarskii, Cooperative Institute for Research in Environmental Sciences (1994)
Klaus Timmerhaus, Chemical and Biological Engineering (1975)
Kaspar Willam, Civil, Environmental, and Architectural Engineering (2004)
Additional Academic Achievements

National Academy of Sciences

Founded in 1863 and considered one of the highest honors for an American scientist or engineer, the National Academy of Sciences is a private, nonprofit, self-perpetuating society of distinguished scholars engaged in scientific and engineering research, dedicated to the furtherance of science and technology and to their use for the general welfare.

Marvin Caruthers, Chemistry and Biochemistry (1994)
Thomas R. Cech, Chemistry and Biochemistry (1987)
Noel Clark, Physics (2007)
Linda Cordell, Anthropology; University Museum (2005)
Eric Cornell, Physics; JILA (2000)
Stanley Cristol, Chemistry and Biochemistry (1972)
Charles DuPuy, Chemistry and Biochemistry (1999)
Lawrence Gold, Molecular, Cellular, and Developmental Biology (1995)
John Hall, Physics; JILA (1984)
Deborah Jin, Physics; JILA (2005)
Carl Lineberger, Chemistry and Biochemistry; JILA (1983)
Richard McIntosh, Molecular, Cellular, and Developmental Biology (1999)
Jane Menken, Sociology; Institute of Behavioral Science (1989)
Joseph Michl, Chemistry and Biochemistry (1986)
Margaret Murnane, Physics, JILA (2004)
Norman Pace, Molecular, Cellular, and Developmental Biology (1991)
David Prescott, Molecular, Cellular, and Developmental Biology (1974)
Margaret Tolbert, Chemistry and Biochemistry; Cooperative Institute for Research in Environmental Sciences (2004)
Gilbert White, Geography (1973)
Carl Wieman, Physics; JILA (1995)
William B. Wood, Molecular, Cellular, and Developmental Biology (1972)
Nobel Laureates

The Nobel Prize is an international award given yearly for achievements in physics, chemistry, economics, medicine, literature, and peace. Nomination and selection of winners vary according to the category and prize-awarding institutions.

Thomas R. Cech, Chemistry and Biochemistry (1989)
Eric Cornell, Physics; JILA (2001)
John Hall, Physics; JILA (2005)
Carl Wieman, Physics; JILA (2001)
Additional Academic Achievements

Guggenheim Fellows

Guggenheim Fellowships are prestigious grants to a select group of individuals that provide fellows with blocks of time in which they can pursue important scholarly work with as much creative freedom as possible. No special conditions are attached to them, and fellows may spend their grant funds in any manner they deem necessary to their work. Since 1949, over 70 CU-Boulder faculty members have been named Guggenheim Fellows.

Len Ackland
Associate Professor, Journalism and Mass Communication (2008)

Professor Ackland was awarded a Guggenheim Fellowship for his book project entitled “Nuclear Power at a Crossroads,” in which he will examine issues surrounding nuclear power from the German, French, and American perspectives. Co-director of CU-Boulder’s Center for Environmental Journalism, Ackland joined the School of Journalism and Mass Communication faculty in 1991. He is the author of Making a Real Killing: Rocky Flats and the Nuclear West. Before coming to CU, he was the editor of the Bulletin of the Atomic Scientists and previously worked as a reporter at newspapers including the Chicago Tribune and Des Moines Register. He received a George Polk Award for reporting on local issues in 1978, and, under his leadership, the Bulletin won the National Magazine Award in 1987 for a special issue on the Chernobyl nuclear accident.

CU-Boulder Guggenheim Fellows in the Past 10 Years

Fred Anderson, History (2001)
Roger Bilham, Geological Sciences (1999)
Albert Chong, Art and Art History (1998)
G. Barney Ellison, Chemistry and Biochemistry (1999)
Barbara Engel, History (2003)
Steven A. Epstein, History (1998)
Bruce W. Holsinger, English (2004)
Paul W. Kroll, East Asian Languages and Civilizations (2007)
Margaret Tolbert, Chemistry and Biochemistry (2005)
Veronica Vaida, Chemistry and Biochemistry (2004)
Mark Winey, Molecular, Cellular, and Developmental Biology (2007)
National Endowment for the Humanities Fellowship

National Endowment for the Humanities Fellowships support individuals pursuing advanced research that is of value to scholars and general audiences in the humanities. Recipients usually produce articles, monographs, books, digital materials, archaeological site reports, translations, editions, and other scholarly tools.

Lynn Parisi
Assistant Director, Center for Asian Studies (2008)

Parisi runs the Program for Teaching East Asia, a part of the university’s Center for Asian Studies, an interdisciplinary organization that brings together faculty, students, and community members to encourage and support Asian scholarship at CU-Boulder and in the larger community. She received a National Endowment for the Humanities Fellowship for her project titled “Visualizing Japan in Modern World History,” a five-day workshop and follow-up activities for 30 teachers from a seven-state region to study the emergence of modern Japan from the late Tokugawa period through the Meiji period during the 19th century. A dedicated teacher and researcher, Parisi has previously received three separate Fulbright grants to teach in China and Japan, as well as the Buchanan Prize of the Association for Asian Studies and the William Hosokawa Award from the Japan-America Society of Colorado.

MacArthur Fellows

The MacArthur Foundation accepts yearly nominations in as broad a range of fields and areas of interest as possible to talented individuals—writers, scientists, artists, social scientists, humanists, teachers—who have shown extraordinary originality and dedication in creative pursuits and marked capacity for self-direction.

Charles Archambeau, Physics (1988)
David Hawkins, Philosophy (1981)
Deborah Jin, Physics; JILA (2003)
Patricia Limerick, History (1995)
Margaret Murnane, Physics; JILA (2000)
Norman Pace, Molecular, Cellular, and Developmental Biology (2001)

National Medal of Science

The National Medal of Science was established by the 86th Congress in 1959 as a Presidential Award to be given to individuals “deserving of special recognition by reason of their outstanding contributions to knowledge in the physical, biological, mathematical, or engineering sciences.”

Marvin Caruthers, Chemistry and Biochemistry (2006)
Thomas R. Cech, Chemistry (1995)
Keith Roberts Porter, Biology (1976)
Gilbert White, Geography (2000)
Packard Fellows

Candidates for a Packard Fellowship must be faculty members eligible to serve as principal investigators engaged in research in the natural and physical sciences or engineering and must be within the first three years of their faculty careers. Disciplines include physics, chemistry, mathematics, biology, astronomy, computer science, earth science, ocean science, and all branches of engineering.

Anton Andreev, Physics (1999)
Kristi Anseth, Chemical and Biological Engineering (1997)
Elizabeth Bradley, Computer Science (1995)
Barbara Demmig-Adams, Ecology and Evolutionary Biology (1992)
David Jonas, Chemistry and Biochemistry (1996)
Karla Kirkegaard, Molecular, Cellular, and Developmental Biology (1989)
John Price, Physics (1990)
Leo Radzihovsky, Physics (1998)
Alexis Templeton, Geological Sciences (2006)
Shijie Zhong, Physics (2001)

Fulbright Fellows

The Fulbright program sends 800 U.S. faculty and professionals abroad each year and is intended for candidates who wish to conduct research, teach, or undertake a combination of both at an academic institution of their choice in a host country. Grantees lecture and conduct research in wide variety of academic and professional fields.

Richard Collins
Professor, Law

Professor Collins, who as director of Colorado Law School’s Byron R. White Center for the Study of American Constitutional Law focuses his work on constitutional issues, received a 2008 Fulbright to teach courses in American constitutional law and human rights law to students at Wuhan University in China. A respected constitutional law scholar, Collins’ recent efforts include a treatise on the Colorado Constitution; an article on sacred sites on government lands in the United States, Australia, New Zealand, and Canada; the current revision of Felix Cohen’s Handbook of Federal Indian Law; and an article in the University of Colorado Law Review on lawmaking by citizens’ initiatives.
Jennifer Fitzgerald  
Assistant Professor, Political Science

A specialist in comparative politics, Professor Fitzgerald’s current research focuses on the ways in which social ties and local context shape political attitudes and behavior in advanced democratic societies. She is currently completing a book manuscript on the socio-contextual correlations between attitudes toward immigration in Western Europe. Fitzgerald’s award will allow her to conduct research on reactions to immigration and the electoral power of extreme right parties in France during the spring and summer of 2008. Her recent publications include the co-authored book *Partisan Families: The Social Logic of Bounded Partisanship in Germany and Britain*. Fitzgerald joined the CU-Boulder faculty in 2005 after receiving her doctoral degree from Brown University.

Stephen Mojzsis  
Associate Professor, Geology

Professor Mojzsis was awarded a Fulbright for his study of how new discoveries about pre-terrestrial zircons—among the oldest existing minerals—have provided surprising insights into the conditions for life’s emergence during the “Hadean” time period nearly four billion years ago—the formative time for the Sun, Earth, and the other planets. Mojzsis, who is a member of the Center for Astrobiology in the CU-Boulder Department of Geological Sciences, traveled to France, where he collaborated with researchers from le Centre de Recherches Pétrographiques et Géochimiques to better understand how geologic conditions 3.8 billion years ago may have led to the origin of life on Earth.