2014 Prize Recipients

Peter Gierasch - 2014 Gerard P. Kuiper Prize
The Division for Planetary Sciences of the American Astronomical Society is pleased to award the 2014 Gerard P. Kuiper Prize for outstanding contribution to planetary science to Peter J. Gierasch.

Dr. Peter Gierasch is a professor of Astronomy at Cornell University and the co-founder of Cornell’s Center for Radiophysics and Space Research, which he led for over a decade. He received his bachelor’s and Ph.D. degrees from Harvard University in Cambridge, Massachusetts, in 1962 and 1968 respectively.

Dr. Gierasch has made outstanding contributions to the understanding of planetary atmospheres in the 49 years of his publication record. He served on numerous planetary missions, including Viking, Pioneer, Voyager, Galileo, and Cassini. His impact on the study of planetary atmospheres is exceptional, his publication record and citations outstanding and, most of all, his publications have had a lasting effect on atmospheric science, with some of his early papers still being frequently cited today, decades after their publication. His papers on the Martian thermal and dynamical structure (1968), zonal-mean properties of Jupiter (1986), and Venus’ atmospheric rotation (1975) were ground-breaking and remain classics in the field. Long before the greenhouse effect and global warming became household terms, Peter worked these puzzles for Mars. He has continued his 1986 work ever since, applying his analyses to the atmospheres of other bodies. His 1975 work on Venus’ atmospheric superrotation (at sixteen times its solid body rotation) is now called the Gierasch mechanism. He discovered the ortho-para H2 potential energy reservoir and worked out its importance for giant-planet circulation. These well-know achievements are just the tip of a very large iceberg. Peter Gierasch is an exceptionally versatile researcher who has produced fundamental work in the highly mathematical theory of planetary atmospheres, has conducted outstanding data analyses, and written code to implement his ideas in general circulation and other models. In addition to his well-known work on the atmospheres of Mars, Venus, and Jupiter, he has also published research on Uranus and even the Sun and Pluto.

Peter Gierasch is also highly respected as a teacher and mentor. As a classroom professor, Peter has made the complicated and sometimes bizarre behavior of rotating fluids come alive to his students. He never drowns his students in mathematics, but rather focuses on developing intuition in the rigorously presented formalism, connecting observable processes to specific terms. His patience and helpfulness to students, and his ability to judge the listener and present an explanation that will be understood, are legendary.

Gierasch is known for the quality of his research mentorship. He has patiently guided undergraduates, graduate students, postdocs, and young soft-money researchers to productive careers. He gives friendly encouragement and is enthusiastic for almost any work as long as it is good. He empowers, rather than overpowers, as can be seen by his large body of collaborative work. Gierasch’s academic descendants have gone on to found PhD programs, to run NASA laboratories, and to populate NASA’s and NSF’s rolls of successful principal investigators.

Gierasch’s co-founding and subsequent leadership of CRSR is in itself a major contribution to planetary science. The Apollo era saw an explosion in the funding and number of faculty positions in planetary science, the founding of the DPS, and the production of a large volume of PhDs. In the post-Apollo era the money continued to flow but the number of faculty positions did not increase. The Center provided a career track for the plethora of planetary PhDs by becoming one of the original soft-money institutes. Under his leadership, CRSR was home to researchers working on planetary missions, a NASA Regional Planetary Imaging Facility, instruments like the Spitzer Infrared Spectrograph and SOFIA FORCAST, numerous ground-based instruments for the Hale telescope on Mt. Palomar and others, and teams involved in Voyager, Galileo, Cassini, and NEAR Shoemaker, just to name a few.

Quiet, fair, patient, and kind almost to a fault, Peter Gierasch is fully deserving of our organization’s highest honor.
Matija Cuk - 2014 Harold C. Urey Prize
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Send graduate school and REU program updates to DPS.EdUpdate@aas.org
The Division for Planetary Sciences of the American Astronomical Society is pleased to award the 2014 Harold C. Urey Prize for outstanding achievement in planetary research by a young scientist to Matija Cuk.

Dr Cuk is currently a researcher at the SETI Institute in Mountain View, California. Matija’s specialty is planetary dynamics and his broad-ranging research is significantly contributing to unravelling the origin of the solar system’s current structure. Matija’s interests span general aspects of planet and satellite formation to modern dynamical processes in the Solar System. His work is driven by observations in the Solar System, primarily dynamical but also chemical and geophysical. He has applied his skills across a remarkably broad range of topics: the origins and evolutions of the Moon, binary asteroids or KBOs, tidal evolution, orbital stability, rotational history and cratering.

For his Ph.D. dissertation, Matija developed the schemes and the analysis for how to capture Irregular satellites, and then investigated the effects of secular resonances on their orbits. These were described as technical tours de force of celestial mechanics. More importantly, during this same period he devised and convincingly demonstrated the BYORP mechanism (binary Yarkovsky-O’Keefe-Radzievskii-Paddack) in which thermal radiation forces affect the orbital and rotational histories of binary asteroids. He realized that a tidally locked binary system intrinsically provides the asymmetry that is the basis of the Yarkovsky mechanism (for an isolated body, the surface morphology accounts for this asymmetry). Other researchers have since elaborated on this mechanism, as has Matija, working with collaborators, some of whom were initially very skeptical of its effectiveness.

Lately, Matija has focused on the Earth-Moon system, including the evolution of the Moon’s orbit and the origin of the lunar cataclysm, and on aspects of the dynamics of unstable bodies in the solar system. His work on lunar Trojans identified a significant flaw in the interpretation of the lunar cratering record. The number density of the craters on the Orientale ejecta blanket (the youngest impact basin) and craters with the freshest morphologies (class 1) are the same, indicating that class 1 craters date back to the tail of the cataclysm. Furthermore, the size-frequency distribution of class 1 craters does not match the main belt. Hence, the widely accepted assumption that the cataclysm was caused by perturbation of the main belt is not strongly supported by observations. Matija’s result shook up the status quo and solicited some strong responses, but no one identified any conceptual flaws in his arguments. The new crater catalog from the Lunar Reconnaissance Orbiter significantly improved the cratering statistics by reducing the errors bars in the size-frequency distributions on different stratigraphic units. The cratering results published from this catalog support Matija’s interpretation of the previously available data, validating his arguments.

Matija’s work on the origin of the Moon sought to address the observed isotopic similarity between the Earth and Moon. In the canonical model for lunar origin, most of the Moon is derived from the mantle of the impactor, which should have had a different isotopic fingerprint than Earth. This contradiction between observations and the predictions from the giant impact model had reached a crisis point in the planetary community, and the giant impact hypothesis was being seriously questioned. Matija identified the angular momentum constraint as a possible pathway to reconciliation between the data and giant impact hypothesis: if the early Earth-Moon system had much higher angular momentum than present day, then alternate style impact events may derive the Moon primarily from Earth’s mantle. However, no one had demonstrated that sufficient angular momentum could be transferred away from the Earth-Moon system to allow for a highspin giant impact event. Matija quickly found that the ejection resonance (when the precession period of the lunar orbit is one year) would be much stronger with an oblate Earth (with the present-day angular momentum budget, the ejection resonance is very weak and the Moon would quickly pass through it). He defined the tidal parameters that led to the largest transfer of angular momentum from the Earth-Moon system to the Earth-Sun system. Matija’s result on the ejection resonance is a major contribution to planetary science. It has opened new directions for understanding the origin and early evolution of the Earth-Moon system. The idea has provoked mass relief from geochemists and healthy skepticism from other dynamicists. Matija’s general result is sound but substantial differences emerge with application of different (and all imperfect) tidal models. It is
possible that the ejection resonance as explored by Matija does not turn out to be the final favored solution for the Moon; but if so, Matija will still have motivated a new area of research in lunar tidal history.

Through his insightful papers, technical brilliance, and independent thinking, Matija Cuk is clearly an outstanding young researcher and worthy of being recognized by the Harold C. Urey Prize.

Athena Coustenis - 2014 Harold Masursky Award
The Division for Planetary Sciences of the American Astronomical Society is pleased to award the 2014 Harold Masursky Award for Meritorious Service to Planetary Science to Dr. Athena Coustenis.

Dr. Coustenis is currently Director of Research at the Centre National de la Recherche Scientifique (CNRS), France, and an astrophysicist with the Laboratoire d'Etudes Spatiales et d'Instrumentation en Astrophysique (LESIA) of Paris Observatory, France. In addition to an impressive scientific research career, Athena has made major contributions to planetary sciences in the spirit of the Harold Masursky award. In particular she has, perhaps more than any other member of our community, made major
contributions to promoting and facilitating international collaboration in planetary science.

Athena has played a major role in organizing the dissemination of scientific results at international conferences, including those of the European Geophysical Union, the International Association of Meteorology and Atmospheric Sciences, the Asia Oceania Geosciences Society, the DPS/AAS, the European Planetary Science Congress, as well as the AGU Goldschmidt conferences and the International Planetary Probe Workshops. She has done this by sponsoring and organizing planetary sessions at these meetings, often taking on the role of guest editor of special issues in scientific journals. She played a leading role in orchestrating the first joint DPS-EPSC meeting, held in France in 2011—an ultimately superbly successful union.

Athena was until last year the President of the Planetary Sciences section of the European Geosciences Union, an enormous scientific society by any standards and one that is highly influential in Europe. She has also taken on leadership roles in various societies. In addition to being the DPS Secretary, she currently serves as the president of the International Association for Meteorology and Atmospheric Sciences of the IUGG, before that serving for several years as the president of the International Commission for Planetary Atmospheres and Environment, one of the units that comprise IAMAS. This represents a considerable effort, particularly as she has maintained her research, mentoring, and flight project duties.

Athena has also led efforts to plan new missions to the outer solar system and has played a considerable role fostering scientific collaborations between ESA and NASA. She was the leader of a European study for a mission to primarily study Saturn's moons Titan and Enceladus (TandEM). She was the lead European scientist for a follow-up joint NASA-ESA study of a Titan/Saturn System Mission. These missions, although not selected, will serve as a template for future plans to return to Saturn. Athena was also the European co-lead of the JUICE mission that will study Europa, Ganymede, and Jupiter's system, which ESA has selected for launch in 2022. As the Chair of ESA's Solar System and Exploration Working Group and a member of ESA's Space Sciences Advisory Committee and Human Space Flight and Exploration Science Advisory Committee, Athena has championed planetary science, ensuring that it remains high profile within ESA. She is currently the President of the European Science Foundation Space Studies Committee.

Athena Coustenis has rendered outstanding service to the international planetary science community through a combination of managerial, leadership, programmatic, and public service activities. For the tireless and wide-ranging service she has provided to the planetary science community, Athena Coustenis is clearly worthy of being recognized by the Harold Masursky award.

Guy Consolmagno - 2014 Carl Sagan Medal
The Division for Planetary Sciences of the American Astronomical Society awards the 2014 Carl Sagan Medal for excellence in public communication to Brother Guy Consolmagno, S.J., Ph.D.

Br. Guy Consolmagno has a decades-long track record of communicating planetary science to the public while maintaining an active science career. In addition, he occupies a unique position within our profession as a credible spokesperson for scientific honesty within the context of religious belief. As a Jesuit Brother, Guy has become the voice of the juxtaposition of planetary science and astronomy with Christian belief, a rational spokesperson who can convey exceptionally well how religion and science can co-exist for believers.

Br. Guy's love of teaching stems from his graduate school days in the 1970s when he spoke about planetary science at science fiction conventions. In the 1980s, when lecturing at the University of Nairobi in the Peace Corps, he traveled to outlying towns to set up a portable telescope for anyone to look through. He discovered that even people living in poverty had a hunger to see and understand the night sky. It is this hunger that he continues to address, both as a planetary scientist and a religious man, in his many presentations and writings. He has an easy-to-understand manner of speaking to an audience that invites people to join his journey of discovery.

Br. Guy uses multiple media to reach his audience. He has authored or edited six books, at least one, “Turn Left At Orion”, in its fourth edition of publication. This book alone has had an enormous impact on the amateur astronomy community, engendering public support for astronomy. His other popular science books have also had a significant impact on public perceptions of science, especially astronomy. Many of his popular books have addressed the scientist’s view of religion in contrast with a religious person’s view of science and have reached a significant audience: Brother Astronomer has one of the best descriptions of the real-life experiences of the ANSMET team that collects meteorites in Antarctica every year. Guy manages to write in an entertaining style about how science is really done, in a way that still manages to capture the imagination. From the point of view of popular publications about astronomy, Guy’s work has unquestionably had an international impact. Some of these have been translated into Italian and Spanish. In addition to writing books, he is a dynamic popular speaker, giving 40 to 50 public lectures every year across both Europe and the United States, reaching thousands of people. He regularly interviews on BBC radio shows on planetary science topics and hosted his own BBC radio show discussing origins of the universe (A Brief History of the End of Everything). These appearances address both pure science subjects (no religious context is presented) and science-with-religion subjects.

Brother Guy has established himself as a careful and well respected researcher, a vibrant member of the planetary science community, and an outstanding communicator of planetary science to the public, in the very best tradition of Carl Sagan.

James Oberg - 2014 Jonathan Eberhart Award
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(https://dps.aas.org)
The Division for Planetary Sciences of the American Astronomical Society awards the 2014 Jonathan Eberhart Planetary Sciences Journalism Award to recognize and stimulate distinguished popular writing on planetary sciences to James Oberg.

James Oberg is a science journalist, space consultant, and retired “rocket scientist.” He spent the first 22 years of his career as a space engineer at NASA’s Johnson Space Center in Houston, where he specialized in space shuttle operations and orbital rendezvous. James has authored some two-dozen books about all aspects of space flight for both the astronomy-interested layman and NASA’s training program. He also has written more than 1,000 magazine and newspaper articles. His work has appeared in Astronomy, The Wall Street Journal, Scientific American, OMNI, Popular Science, Popular Mechanics, and others. In addition, James has served as the NBC News space consultant for a decade. He is considered an expert on the Russian space program and U.S. space policy.

James earned a Bachelor of Arts in mathematics from Ohio Wesleyan University, a Master of Science in applied math from Northwestern University, and a Master of Science in computer science from the University of New Mexico. He also served in the military after his Northwestern education.

In his winning entry, “Torrid Mercury’s icy poles,” from Astronomy magazine’s December 2013 issue, James expertly explores the history of the search for the innermost planet’s water ice and what the MESSENGER spacecraft, launched in 2004, is revealing. The saga of water ice hiding in the shadows on Mercury ranks among the most fascinating chapters in the story of the solar system’s birth and evolution.

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