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FOR IMMEDIATE RELEASE

## **A crazy result delivers the \$500,000 Gruber Cosmology Prize to two teams who discovered the accelerating universe**

July 17, 2007, New York, New York – Saul Perlmutter and Brian Schmidt and their teams: the Supernova Cosmology Project and the High-z Supernova Search team, will receive the 2007 Gruber Cosmology Prize for their discovery that the expansion of the Universe is accelerating. They will receive the prize at a ceremony at the University of Cambridge on September 7.

An accelerating universe was a crazy result that was hard to accept. Yet, two teams, racing neck and neck, simultaneously came to the same conclusion. Their discovery led to the idea of an expansion force, dubbed dark energy. And it suggests that the fate of the universe is to just keep expanding, faster and faster.

The two teams expected to find that the universe would either expand then contract, or it would expand for ever but slowing over the millennia. But there were a growing number of hints that all was not right with the theories of the time.

To find out, they not only needed to be able to measure the speed with which distant objects are travelling away from us, but also how far away they are. And to do this they needed standardized light sources — very bright ones that would be visible to Earth-based telescopes despite being billions of light years away and billions of years old.

The standard light sources they used were exploding stars — in particular Type Ia supernovae. But finding them wasn't easy. Then the analyses over the results turned up very surprising results. "The data wasn't behaving as we thought it would," says Schmidt. "There was a lot of nervous laughter," says Perlmutter. For both teams it was not what they were expecting. For months they both tried to figure out where they had gone wrong, searching for any tiny source of error. But the data was right. The accepted model of the universe was wrong.

Today Perlmutter, Schmidt and their colleagues continue to explore the implications of their work. Schmidt is planning the SkyMapper project, a telescope to map the southern sky. Perlmutter is working on a satellite mission that would study supernovae and the nature of dark energy.

The \$US500,000 prize will be shared in four parts: by Schmidt — at the Australian National University; Saul Perlmutter — at the University of California, Berkeley; and the fifty-one co-authors of the key papers.

The Cosmology Prize honors a leading cosmologist, astronomer, astrophysicist or scientific philosopher for theoretical, analytical or conceptual discoveries leading to fundamental advances in the field.

Since 2001, the Cosmology Prize has been awarded in collaboration with the International Astronomical Union. The Foundation's other international prizes are in Genetics, Neuroscience, Justice and Women's Rights. Nominations for the 2008 prizes are now open and close on December 31, 2007.

Profiles of Perlmutter and Schmidt, photos, background information and nomination details for 2008 are available online at [www.gruberprizes.org](http://www.gruberprizes.org).

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### Additional Information

The official citation reads: The Peter and Patricia Gruber Foundation proudly presents the 2007 Cosmology Prize to Saul Perlmutter and Brian Schmidt, and to the Supernova Cosmology Project and the High-z Supernova Search teams, for their discovery that the expansion of the Universe is currently accelerating.

These observations required the development of new techniques that use supernovae exploding within distant galaxies to measure precise distances across a large fraction of the observable Universe.

The discovery of the accelerated expansion has radically changed our perception of cosmic evolution.

The team members jointly recognized by the prize are:

Saul Perlmutter and the Supernova Cosmology Project team from Australia, Chile, France, Spain, Sweden, UK and USA.

1. Gregory Aldering, Lawrence Berkeley National Laboratory
2. Brian J. Boyle, Australia Telescope National Facility
3. Patricia G. Castro, Instituto Superior Técnico, Lisbon
4. Warrick Couch, Swinburne University of Technology
5. Susana Deustua, American Astronomical Society
6. Richard Ellis, California Institute of Technology
7. Sebastien Fabbro, Instituto Superior Técnico, Lisbon
8. Alexei Filippenko, University of California, Berkeley (also a member of the High-z team)
9. Andrew Fruchter, Space Telescope Science Institute
10. Gerson Goldhaber, Lawrence Berkeley National Laboratory
11. Ariel Goobar, University of Stockholm
12. Donald Groom, Lawrence Berkeley National Laboratory
13. Isobel Hook, University of Oxford
14. Mike Irwin, University of Cambridge
15. Alex Kim, Lawrence Berkeley National Laboratory
16. Matthew Kim
17. Robert Knop, Vanderbilt University
18. Julia C. Lee, Harvard University
19. Chris Lidman, European Southern Observatory
20. Richard McMahon, University of Cambridge
21. Thomas Matheson, NOAO Gemini Science Center
22. Heidi Newberg, Rensselaer Polytechnic Institute
23. Peter Nugent, Lawrence Berkeley National Laboratory
24. Nelson Nunes, University of Cambridge
25. Reynald Pain, CNRS-IN2P3, Paris
26. Nino Panagia, Space Telescope Science Institute
27. Carl Pennypacker, University of California, Berkeley
28. Robert Quimby, The University of Texas
29. Pilar Ruiz-Lapuente, University of Barcelona
30. Brad Schaefer, Louisiana State University



31. Nicholas Walton, University of Cambridge

And for the High-z Supernova Search Team: Brian Schmidt and his team from the USA, UK, Germany, Chile and Australia,

1. Peter Challis, Harvard University
2. Alejandro Clocchiatti, Pontificia Universidad Católica de Chile
3. Alan Diercks, Institute for Systems Biology, Seattle
4. Alexei V. Filippenko, University of California, Berkeley
5. Peter M. Garnavich, University of Notre Dame
6. Ronald L. Gilliland, Space Telescope Science Institute
7. Craig J. Hogan, University of Washington
8. Saurabh Jha, Stanford Linear Accelerator Center
9. Robert P. Kirshner, Harvard University
10. Bruno Leibundgut, European Southern Observatory
11. Mark M. Phillips, Carnegie Observatories
12. David Reiss, Institute for Systems Biology, Seattle
13. Adam G. Riess, John Hopkins University
14. Robert A. Schommer (Deceased)
15. R. Chris Smith, Cerro Tololo Inter-American Observatory, Chile
16. Jason Spyromilio, European Southern Observatory
17. Christopher Stubbs, Harvard University
18. Nicholas B. Suntzeff, Texas A&M University
19. John L. Tonry, Institute for Astronomy, Honolulu

There were several papers relating to the discovery. The most significant are:

- Riess et al., 1998, AJ, 116, 1009, "Observational Evidence from Supernovae for an Accelerating Universe and a Cosmological Constant"  
<http://www.journals.uchicago.edu/AJ/journal/issues/v116n3/980111/980111.web.pdf>
- Perlmutter et al. 1999, ApJ, 517, 565, "Measurements of Omega and Lambda from 42 High-Redshift Supernovae"  
<http://www.journals.uchicago.edu/ApJ/journal/issues/ApJ/v517n2/39148/39148.web.pdf>

**The past recipients of the Cosmology Prize are:**

- 2006: **John Mather and the Cosmic Background Explorer (COBE) Team** for studies confirming that our universe was born in a hot Big Bang
- 2005: **James E. Gunn** for leading the design of a silicon-based camera for the Hubble Space Telescope and developing the original concept for the Sloan Digital Sky Survey
- 2004: **Alan Guth** and **Andrei Linde** for their roles in developing and refining the theory of cosmic inflation
- 2003: **Rashid Alievich Sunyaev** for his pioneering work on the nature of the cosmic microwave background and its interaction with intervening matter
- 2002: **Vera Rubin** for discovering that much of the Universe is unseen black matter, through her studies of the rotation of spiral galaxies
- 2001: **Martin Rees** for his extraordinary intuition in unraveling the complexities of the universe



- 2000: **Allan R. Sandage** and **Phillip J. E. (Jim) Peebles**: Sandage for pursuing the true values of the Hubble constant, the deceleration parameter and the age of the universe; Peebles for advancing our understanding of how energy and matter formed the rich patterns of galaxies observed today.

The Prize recipients are chosen by the Cosmology Selection Advisory Board. Its members are: James Peebles, Princeton University; Ronald Ekers, Australia Telescope National Facility - CSIRO; Jocelyn Bell Burnell, University of Oxford; Roger Penrose, University of Oxford; Peter Galison, Harvard University; Simon D.M. White, Max-Planck-Institut fuer Astrophysik; Jacqueline Bergeron, Institut d'Astrophysique-CNRS.

Owen Gingerich of the Harvard-Smithsonian Center for Astrophysics, and Virginia Trimble of the University of California Irvine also serve as special cosmology advisors to the Foundation.

**The Gruber Prize Program** honors contemporary individuals in the fields of Cosmology, Genetics, Neuroscience, Justice and Women's Rights, whose groundbreaking work provides new models that inspire and enable fundamental shifts in knowledge and culture. The Selection Advisory Boards choose individuals whose contributions in their respective fields advance our knowledge, potentially have a profound impact on our lives, and, in the case of the Justice and Women's Rights Prizes, demonstrate courage and commitment in the face of significant obstacles.

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The Peter and Patricia Gruber Foundation honors and encourages educational excellence, social justice and scientific achievements that better the human condition. For more information about Foundation guidelines and priorities, please visit [www.gruberprizes.org](http://www.gruberprizes.org).

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### **Affiliation with International Astronomical Union**

In 2000, the Peter Gruber Foundation and the International Astronomical Union (IAU) announced an agreement by which the IAU provides its expertise and contacts with professional astronomers worldwide for the nomination and selection of Cosmology Prize winners. Under the agreement, the Peter Gruber Foundation also funds a fellowship program for young astronomers, with the aim of promoting the continued recruitment of new talent into the field.

The International Astronomical Union, founded in 1919, is an organization of professional astronomers. It serves today a membership of more than 9,000 individual astronomers from 85 countries, worldwide. Information about the activities of the IAU is available from [www.iau.org](http://www.iau.org).

**For more information on the Gruber Prizes** email [media@gruberprizes.org](mailto:media@gruberprizes.org) or contact Berneta Akin of the Gruber Foundation at +1 (340) 775-8035 or by mail 140 W 57th St Suite 10C New York, NY 10019.

Media materials and additional background information on the Gruber Prizes can be found at our online newsroom: [www.gruberprizes.org/Press.php](http://www.gruberprizes.org/Press.php)

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