



Prof. John Cromwell Mather
Senior Astrophysicist
NASA's Goddard Space Flight Center
USA

National Aeronautics and Space Administration
Office of the Administrator
Washington, DC 20546-0001



November 30, 2012

Lillyan Hernandez
Secretary General
Consejo Cultural Mundial
Apartado Postal 10.1083
Col. Lomas de Chapultepec,
C.P. 11002 Mexico, D.F.
MEXICO

Dear Ms. Hernandez:

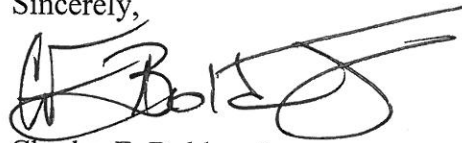
Thank you for the invitation to nominate candidates for the 2013 World Awards in Science and Arts. On behalf of the National Aeronautics and Space Administration (NASA), it is my pleasure to submit the nomination of John C. Mather, NASA Goddard Space Flight Center, for the 2013 Albert Einstein World Award of Science.

Dr. Mather is an eminent astrophysicist and cosmologist whose work and leadership has led to major advances in the understanding of our origins and place in the universe. His signature work, for which he was awarded the Nobel Prize in Physics in 2006, was in pioneering observations of the relic background radiation left over from the Big Bang, which led to the resolution of fundamental questions on the nature of the universe. Currently, Dr. Mather is serving as the scientific lead for the James Webb Space Telescope (JWST), which when launched in 2018 will be the largest, most complex telescope ever launched into space. This technological marvel is designed to observe the formation of the first stars and galaxies a few hundred million years after the Big Bang and the atmospheres of Earth-like planets orbiting around other stars. It will provide a true leap forward in our ability to understand our origins and search for life beyond our solar system. The concept for the JWST mission was developed under Dr. Mather's leadership beginning in 1995, and he continues to provide top-level scientific leadership on every aspect of the project both nationally and internationally.

In addition to the Nobel Prize, Dr. Mather's achievements have been recognized with membership in the National Academy of Sciences and with numerous and wide-ranging awards. He is the author of many publications, including his book entitled "Very First Light," which was written along with John Boslough. He has given many public lectures to help the public understand his work and to inspire young people to be as excited about science as he has been. In 2007, Mather was listed among Time magazine's 100 Most Influential People in The World and most recently in 2011 listed among Time magazine's 25 most influential people in space.

Dr. Mather's outstanding work and leadership has provided a unique service by opening a window into space and avenues of discovery for both scientists and the public to access to a deeper understanding of space and astronomy and a higher appreciation for our place in the universe. Please accept this nomination of John Mather for the Albert Einstein World Award.

Sincerely,

A handwritten signature in black ink, appearing to read 'C. Bolden, Jr.', with a long horizontal flourish extending to the right.

Charles F. Bolden, Jr.
Administrator

Enclosures

Nomination of Dr John C. Mather for the “Albert Einstein” World Award of Science.

Dr John C. Mather (born August 7, 1946, Roanoke, Virginia) is an astrophysicist and cosmologist who has led and is leading projects that provide major advances in understanding of our origins. His signature work, for which he was awarded the Nobel Prize, was pioneering observations of the relic background radiation left over from the Big Bang which resolved a fundamental human question on the nature of the Universe. More recently Mather has been the science leader for the James Webb Space Telescope, which NASA plans to launch in 2018, a space based observatory that will observe the first galaxies forming a few hundreds of million years after the Big Bang, and will probe the atmosphere of terrestrial planets in other solar systems. JWST will be a true leap forward in the capabilities of human-kind to address the question *are we alone in the Universe?*

John Mather serves as the James Webb Space Telescope (JWST) Senior Project Scientist. When it is launched in 2018 the JWST (led by NASA with European and Canadian participation) will be the largest telescope launched into space (6.6 m diameter compared with 2.4 m for the Hubble Space Telescope). The telescope will be folded up for launch and deploy once launched. It has a highly advanced package of instruments operating at infrared wavelengths. This technological marvel is designed to observe the formation of the first stars and galaxies a few hundred million years after the Big Bang and the atmospheres of Earth-like planets orbiting around other stars – a true leap forward in the capabilities of human-kind to understand our origins and search for life beyond our solar system. Mather provides top-level scientific leadership for every part of the JWST project both nationally and internationally. The concept for the mission was developed under his leadership beginning in 1995. None of this could have been accomplished without Dr. Mather’s leadership in identifying the scientific objectives, the mission concept, and the technological breakthroughs that would be required.

John Mather was the driving force behind NASA’s Cosmic Background Explorer satellite (COBE). In 1974, only 6 months out of graduate school, Dr. Mather realized that precision measurements of the Cosmic Microwave Background from space were necessary to the fundamental question on whether the Universe had begun in a hot Big Bang or had existed in a steady state forever. He led one of several teams that proposed what ultimately became NASA’s COBE mission to address this question. As Project Scientist and one of the three Principal Investigators, Mather oversaw the engineering design of the mission and the delivery of scientific results. His personal leadership was responsible for the entire mission, from concept to ultimate success. At the time the COBE mission was a technological *tour de force*. It advanced technologies that were not mature when the mission was proposed, including liquid helium cooled instruments, cryogenic mechanisms, infrared and microwave detectors, antennas with extraordinary ability to avoid interference from warm objects, and differential instrument designs capable of orders of magnitude improvement in accuracy.

On Oct. 3, 2006, the Nobel Foundation announced that “The Royal Swedish Academy of Sciences has decided to award the Nobel Prize in Physics for 2006 jointly to John C. Mather, NASA Goddard Space Flight Center, and George F. Smoot, University of California, Berkeley, CA, USA ‘for their discovery of the blackbody form and anisotropy of the cosmic microwave background radiation’.” The scientific results of the COBE mission sparked a revolution in cosmology, transforming it from speculation to precise computation and prediction. Prior to COBE the two prevailing theories of the universe were the hot Big Bang and the Steady State. Following COBE, the hot Big Bang was the only remaining theory, the temperature of the universe was known to 3 decimal places, and the hot and cold spots (anisotropies) in the Big Bang material were measured in a discovery that Stephen Hawking called the “greatest discovery of the century, if not of all time.” When the first data were shown to the American Astronomical Society in 1990, there was a standing ovation from scientists not normally known for showing their emotions. The results were front-page news around the world, and many thousands of scientific papers have been based on the detailed maps produced by the COBE. After the COBE, hundreds of scientists worldwide have continued with further ground-based, balloon-borne, and space-based measurements. All of these activities are traceable to Dr. Mather’s leadership of the COBE mission.

John Mather is a senior astrophysicist at NASA’s Goddard Space Flight Center in Maryland and adjunct professor of physics at the University of Maryland, College Park. Mather is a member of the National Academy of Sciences and the American Academy of Arts and Sciences. In addition to the Nobel Prize his achievements have been recognized with awards from the National Air and Space Museum, the American Astronomical Society, the American Academy of Arts and Sciences, the Franklin Institute, the City of Philadelphia, Aviation Week and Space Technology, the University of Arizona, the University of Texas, the Society of Photo-optical Instrumentation Engineers, and the Pat and Peter Gruber Foundation. He is the author of many publications, including his book the “Very First Light”, which was written along with John Boslough. He has given many public lectures, to help the public understand the work he has done and hopes to do in the future, and to inspire young people to be as excited about science as he has been. In 2007, Mather was listed among Time magazine’s 100 Most Influential People in The World and most recently in 2011 listed among Time magazine’s 25 most influential people in space.

The "Albert Einstein" World Award of Science is dedicated to scientists who have brought true benefit and well-being to mankind. John Mather's work has provided a unique service by opening a window into space and avenues of discovery for people who would otherwise not have any access to a deeper understanding of space and astronomy, and to thereby develop a higher appreciation for our place in the Universe.

Observational Cosmology Laboratory

NAME: John C. Mather

PRESENT POSITION:

Senior Astrophysicist and Goddard Fellow
Observational Cosmology Laboratory, Code 665
Astrophysics Division
Sciences and Exploration Directorate
NASA's Goddard Space Flight Center

RESEARCH AREA EXPERIENCE: Cosmology, Far IR astronomy and instrumentation, Fourier transform spectroscopy, large space telescopes, interplanetary dust, diffuse background radiation

EDUCATION: 1968 B.A. (Physics), Swarthmore College, (Highest Honors, Phi Beta Kappa)
1974 Ph.D. (Physics), Univ. of California at Berkeley (4.0 GPA)

OTHER POSITIONS:

1974 - 1976 NAS-NRC Research Associate, Goddard Institute for Space Studies
1975 Lecturer in Astronomy, Columbia University
1976 - pres Principal Investigator, COBE FIRAS (Far Infrared Absolute Spectrophotometer)
1976 - 1982 Study Scientist, COBE (Cosmic Background Explorer)
1982 - pres Project Scientist, COBE
1976 - pres Astrophysicist, Goddard Space Flight Center
1988 - 1989 Head, Infrared Astrophysics Branch, GSFC
1989 - 1990 Senior Scientist, GSFC
1990 - 1993 Head, Infrared Astrophysics Branch, GSFC
1993 - pres Senior Astrophysicist (3104), GSFC
1994 - pres Goddard Fellow, GSFC
1995 - pres Study Scientist and Senior Project Scientist, Next Generation (James Webb) Space Telescope
2007-2008 Chief Scientist, Science Mission Directorate, NASA HQ (part time)
2011 - pres College Park Professor, Department of Physics, University of Maryland

OTHER DUTIES:

1992 - 1994 Chair, Board of External Advisors, Center for Astrophysical Research in Antarctic (CARA)
1992 Member, NASA Lunar Astrophysics Management Operations Working Group
1992 - pres Adjunct Professor, Physics, University of Maryland

1995	Member, National Acad. of Sciences committee on GP-B
1996 - 1998	Member, Structure and Evolution of the Universe subcommittee
1996	Co-Chair, Origins Technology Working Group
1996 - 2000	Member, New Millennium Program Science Working Group
1998 - 2002	Member, MMA (Millimeter Array, became ALMA) Oversight Committee for NSF
1998 - 2001	Councilor, American Astronomical Society
1998 - 2001	NAS/NRC Board on Physics and Astronomy
1999	HST Second Decade Committee, Bob Brown, Chair
2001 - 2002	Member, National Academy of Sciences Committee on the Physics of the Universe
2003	Member, National Academy of Sciences committee on GP-B
2003-2005	Member, Standing Review Board, Kepler project
2005	Member, Exoplanet Roadmap Committee
2006-2007	Member, Astrophysics Subcommittee, NASA Advisory Committee
2006 -	President, John and Jane Mather Foundation for Science and the Arts
2008 -	Member, Board of Directors, Center for Excellence in Education
2008	Chair, Blue Ribbon panel, SOFIA scientific program review
2010 - 2011	Member, National Academy of Science committee, "Conceptual Framework for New Science Education Standards"

AWARDS:

Open Scholarship (honorary), Swarthmore, 1964-68
Putnam national math contest, 1967, 27th place nationwide
Highest possible score (990), physics Grad Records, 1968
Highest Honors and Phi Beta Kappa, Swarthmore 1968
NSF Fellowship and honorary Woodrow Wilson Fellowship 1968-70
Hertz Foundation Fellowship, 1970-74
Group Achievement Award, GSFC, 1978
Exceptional Achievement Award, GSFC, 1986
Certificate of Recognition, Inventions and Contributions, GSFC, 1986
John C. Lindsay Memorial Award (NASA-GSFC), 1990
Group Achievement Award (NASA-GSFC), 1990
NASA Exceptional Scientific Achievement Award, 1991
NASA Group Achievement Award, 1991
Rotary National Space Achievement Award, 1991
National Air and Space Museum Trophy, 1991
Aviation Week and Space Technology Laurels, 1992, for Space/Missiles
Discover Magazine Technology Award finalist, 1993
American Institute of Aeronautics and Astronautics Space Science Award, 1993
Dannie Heineman Prize for Astrophysics, American Astronomical Society and American Institute of Physics, 1993 (presented Jan. 1994)
Senior Astrophysicist (3104 position), 1993, GSFC

Goddard Fellow, 1994, GSFC
Honorary Doctor of Science Degree, Swarthmore College, 1994
John Scott Award, City of Philadelphia, 1995
Rumford Prize, American Academy of Arts and Sciences, 1996
Fellow, American Physical Society, 1996
Hall of Fame, Aviation Week and Space Technology, 1997
Member, National Academy of Sciences, 1997
GSFC Group Achievement Award, Next Generation Space Telescope, 1997
Marc Aaronson Memorial Prize, 1998
Member, American Academy of Arts and Sciences, 1998
Benjamin Franklin Medal in Physics, Franklin Institute, 1999
NASA/GSFC Outstanding Teamwork award for NGST SEB, 1999
Newton (NJ) High School Hall of Fame, 2003
Presidential Rank Distinguished Performance award, NASA, 2003
George W. Goddard Award, Society of Photo-Optical Instrumentation Engineers, 2005
Cosmology prize, Pat and Peter Gruber Foundation, 2006
Nobel Prize in Physics, with George Smoot, 2006
Fellow, Society of Photo-optical Instrumentation Engineers, 2006
Award in Physics, Washington Academy of Sciences, 2006
Antoinette de Vaucouleurs medal, U of TX, 2007
NASA Distinguished Service Medal, 2007
Robinson Prize in Cosmology, Newcastle University, 2008
Presidential Rank Distinguished Performance award, NASA, 2008
D. Sci. (Honorary), University of Maryland, College Park, 2008
Fellow, Optical Society of America, 2009
Gold Medal, Prime Minister of India, 2009
Award of Excellence, NJ Educational Association, 2010
GSFC Group Achievement Award, WISE science team, 2011
Daniel Chalonge medal, Observatoire de Paris, 2011
Fellow, American Association for Advancement of Science, 2012

MEMBERSHIPS:

American Astronomical Society, American Physical Society, Sigma Xi, International Astronomical Union, National Academy of Sciences, American Academy of Arts and Sciences, Optical Society of America, American Institute of Aeronautics and Astronautics, Society of Photo-Optical Instrumentation Engineers (SPIE)

PUBLICATIONS:

John C. Mather has published scientific papers primarily in Applied Optics, the Astrophysical Journal, and various conference proceedings.

BOOKS

1. J.C. Mather and J. Boslough, "The Very First Light," Basic Books, New York, 1996. Second edition, 2008.

REFEREED PUBLICATIONS

1. J.C. Mather, M.W. Werner, and P.L. Richards, "A Search for Spectral Features in the Submillimeter Background Radiation," *Ap. J.*, 170, L59, 1971.
2. P. Thaddeus, J.C. Mather, J.H. Davis, and G.N. Blair, "Observation of the $J = 1_0$ Rotational Transition of Vibrationally Excited Silicon Monoxide," *Ap. J. Letters*, 192, L33, 1974.
3. J.C. Mather, P.L. Richards, and D.P. Woody, "Balloon-Based Measurements of the Cosmic Background Radiation," *IEEE Trans. Microwave Theory and Technique MTT-22*, 1046, 1974.
4. D.P. Woody, N.S. Nishioka, P.L. Richards, and J.C. Mather, "Measurement of the Submillimeter Cosmic Background," *Phys. Rev. Letters*, 34, 1036, 1975.
5. J.C. Mather, "Broadband Flared Horn with Low Sidelobes," *IEEE Trans. Antennas and Propagation*, AP-29, 967, 1981.
6. J.C. Mather, "Bolometer Cavity Design for Efficiency," *Applied Optics*, 20, 3992-3, 1981.
7. J.C. Mather, "Nonequilibrium Theory of Cryogenic Bolometer Noise," *Applied Optics*, 21, 1125, 1982.
8. M.S. Miller, W.L. Eichhorn, and J.C. Mather, "Sky Input Horn for a Far Infrared Interferometer," *Optics Letters*, 7, 210, 1982.
9. J.C. Mather, "The Cosmic Background Explorer (COBE)," *Optical Engineering*, 21, 769-774, 1982.
10. J.C. Mather, "Bolometers: Ultimate Sensitivity, Optimization, and Amplifier Coupling," *Applied Optics*, 23, 584-8, 1984.
11. M.G. Hauser, R.F. Silverberg, M.T. Stier, T. Kelsall, D.Y. Gezari, E. Dwek, D. Walser, J.C. Mather, and L.H. Cheung, "Submillimeter Wavelength Survey of the Galactic Plane from $l = -5^\circ$ to $l = +62^\circ$ Structure and Energetics of the Inner Disk," NASA Tech. Memorandum 86077 and *Ap. J.*, 285, 74, 1984.
12. D. McCammon, S.H. Moseley, J.C. Mather and R.F. Mushotzky, "Experimental Tests of a Single-Photon Calorimeter for X-Ray Spectroscopy," *J. Appl. Phys.*, 56, 1263, 1984.
13. S.H. Moseley, J.C. Mather, and D. McCammon, "Thermal Detectors as X-Ray Spectrometers," *J. Appl. Phys.*, 56, 1257, 1984; NASA TM-86092.

14. J.C. Mather, "Electrical Self Calibration of Non-Ideal Bolometers," *Applied Optics*, 23, 3181-3, 1984.
15. H. Hemmati, J.C. Mather, and W.L. Eichhorn, "Submillimeter and Millimeter Wave Characterization of Absorbing Materials," *Applied Optics*, 24, 4489, 1985.
16. J.C. Mather and D.E. Jennings, "Michelson Interferometer with Separated Inputs and Outputs, Double Pass, and Compensation," *Applied Optics*, 24, 3437, 1985.
17. S.H. Moseley, R.L. Kelley, J.C. Mather, R.F. Mushotzky, A.E. Szymkowiak, and D. McCammon, "Thermal Detectors as Single Photon X-Ray Spectrometers," *IEEE Transactions Nuclear Science*, NS-32, 134, 1985, and NASA TM-86092.
18. J.C. Mather, M. Toral, and H. Hemmati, "Heat Trap with Flare as Multimode Antenna," *Applied Optics*, 25, 2826-30, 1986.
19. E. Dwek, Y. Rephaeli, and J.C. Mather, "Infrared Emission from Dust in the Coma Cluster of Galaxies," *Astrophysical Journal*, 350, 104, 1990. Also in NASA Ames Research Center, *Interstellar Dust: Contributed Papers*, p. 353, 1989.
20. J.C. Mather, E.S. Cheng, R.E., Jr., R. B. Isaacman, S.S. Meyer, R.A. Shafer, R. Weiss, E.L. Wright, C.L. Bennett, N.W. Boggess, E. Dwek, S. Gulkis, M.G. Hauser, M. Janssen, T. Kelsall, P.M. Lubin, S.H. Moseley, Jr., T.L. Murdock, R.F. Silverberg, G.F. Smoot, and D.T. Wilkinson, "A Preliminary Measurement of the Cosmic Microwave Background Spectrum by the Cosmic Background Explorer (COBE) Satellite," *Astrophysical Journal*, 354, L37-L40, 1990.
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22. G.F. Smoot, C.L. Bennett, A. Kogut, J. Aymon, C. Backus, G. DeAmici, K. Galuk, P.D. Jackson, P. Keegstra, L. Rokke, L. Tenorio, S. Torres, S. Gulkis, M.G. Hauser, M. Janssen, J.C. Mather, R. Weiss, D.T. Wilkinson, E.L. Wright, N.W. Boggess, E.S. Cheng, T. Kelsall, P. Lubin, S. Meyer, S.H. Moseley, T.L. Murdock, R.A. Shafer, and R.F. Silverberg, "Preliminary Results from the COBE Differential Microwave Radiometers: Large-Angular-Scale Isotropy of the Cosmic Microwave Background," *Astrophysical Journal*, 371, L1-L5, 1991.
23. E.L. Wright, J.C. Mather, C.L. Bennett, E.S. Cheng, R.A. Shafer, D.J. Fixsen, R.E. Eplee, Jr., R.B. Isaacman, S.M. Read, N.W. Boggess, S. Gulkis, M.G. Hauser, M. Janssen, T. Kelsall, P.M. Lubin, S.S. Meyer, S.H. Moseley, Jr., T.L. Murdock, R.F. Silverberg, G.F.

- Smoot, R. Weiss, D.T. Wilkinson, "Preliminary Spectral Observations of the Galaxy with a 7° Beam by the Cosmic Background Explorer (COBE)," *Astrophysical Journal*, 381, 200-209, 1991.
24. C.L. Bennett, G.F. Smoot, M. Janssen, S. Gulkis, A. Kogut, G. Hinshaw, C. Backus, M.G. Hauser, J.C. Mather, L. Rokke, L. Tenorio, R. Weiss, D.T. Wilkinson, E.L. Wright, G. DeAmici, N.W. Boggess, E.S. Cheng, P.D. Jackson, P. Keegstra, T. Kelsall, R. Kummerer, C. Lineweaver, S.H. Moseley, T.L. Murdock, J. Santana, R.A. Shafer, R.F. Silverberg, "COBE Differential Microwave Radiometers (DMR): Calibration Techniques," *Astrophysical Journal*, 391, 466-482, 1992.
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 26. G.F. Smoot, C.L. Bennett, A. Kogut, E.L. Wright, J. Aymon, M.W. Boggess, E.S. Cheng, G. DeAmici, S. Gulkis, M.G. Hauser, G. Hinshaw, C. Lineweaver, K. Loewenstein, P.D. Jackson, M. Janssen, E. Kaita, T. Kelsall, P. Keegstra, P. Lubin, J.C. Mather, S.S. Meyer, S.H. Moseley, T.L. Murdock, L. Rokke, R.F. Silverberg, L. Tenorio, R. Weiss, D.T. Wilkinson, "Structure in the COBE DMR First Year Maps," *Astrophysical Journal Letters*, 396, L1-L5, 1992.
 27. C.L. Bennett, G.F. Smoot, G. Hinshaw, E.L. Wright, A. Kogut, G. DeAmici, S.S. Meyer, R. Weiss, D.T. Wilkinson, S. Gulkis, M. Janssen, N.W. Boggess, E.S. Cheng, M.G. Hauser, T. Kelsall, J.C. Mather, S.H. Moseley, T.L. Murdock, and R.F. Silverberg, "Preliminary Separation of Galactic and Cosmic Microwave Emission of the COBE-DMR," *Astrophysical Journal Letters*, 396, L7-L12, 1992.
 28. E.L. Wright, S.S. Meyer, C.L. Bennett, N.W. Boggess, E.S. Cheng, M.G. Hauser, A. Kogut, C. Lineweaver, J.C. Mather, G.F. Smoot, R. Weiss, S. Gulkis, G. Hinshaw, M. Janssen, T. Kelsall, P.M. Lubin, S.H. Moseley, T.L. Murdock, R.A. Shafer, R.F. Silverberg, and D.T. Wilkinson, "Interpretation of the CMB Anisotropy Detected by the COBE DMR," *Astrophysical Journal Letters*, 396, L13-L18, 1992.
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 30. A. Kogut, C. Lineweaver, G.F. Smoot, C.L. Bennett, A. Banday, N.W. Boggess, E.S. Cheng, G. De Amici, D.J. Fixsen, G. Hinshaw, P.D. Jackson, M. Janssen, P. Keegstra, K. Loewenstein, P. Lubin, J.C. Mather, L. Tenorio, R. Weiss, D.T. Wilkinson, and E.L.

Wright, "Dipole Anisotropy in the COBE Differential Microwave Radiometers First-Year Sky Maps," *Astrophysical Journal*, 419, 1-6, 1993.

31. J.C. Mather, E.S. Cheng, D.A. Cottingham, R.E. Eplee, Jr., D.J. Fixsen, T. Hewagama, R.B. Isaacman, K.A. Jensen, S.S. Meyer, P.D. Noerdlinger, S.M. Read, R.A. Shafer, E.L. Wright, C.L. Bennett, N.W. Boggess, M.G. Hauser, T. Kelsall, S.H. Moseley, Jr., R.F. Silverberg, G.F. Smoot, R. Weiss, and D.T. Wilkinson, "Measurement of the Cosmic Microwave Background Spectrum by the COBE FIRAS," *Astrophysical Journal*, 420, 439-444, 1994.
32. D.J. Fixsen, E.S. Cheng, D.A. Cottingham, R.E. Eplee, Jr., R.B. Isaacman, J.C. Mather, S.S. Meyer, P.D. Noerdlinger, R.A. Shafer, R. Weiss, E.L. Wright, C.L. Bennett, N.W. Boggess, T. Kelsall, S.H. Moseley, R.F. Silverberg, G.F. Smoot, and D.T. Wilkinson, "Cosmic Microwave Background Dipole Spectrum Measured by the COBE FIRAS," *Astrophysical Journal*, 420, 445-449, 1994.
33. E.L. Wright, J.C. Mather, D.J. Fixsen, A. Kogut, R.A. Shafer, C.L. Bennett, N.W. Boggess, E.S. Cheng, R.F. Silverberg, G.F. Smoot, and R. Weiss, "Interpretation of the COBE FIRAS Spectrum," *Astrophysical Journal*, 420, 450-456, 1994.
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35. C.L. Bennett, A. Kogut, G. Hinshaw, A.J. Banday, E.L. Wright, K. Gorski, D.T. Wilkinson, R. Weiss, G.F. Smoot, S.S. Meyer, J.C. Mather, P. Lubin, K. Loewenstein, C. Lineweaver, P. Keegstra, E. Kaita, P.D. Jackson, and E.S. Cheng, "Cosmic Temperature Fluctuations from Two Years of COBE DMR Observations," *Astrophysical Journal*, 436, 423-442, 1994.
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37. J.C. Mather, "Infrared Measurements from the Cosmic Background Explorer (COBE)," *Infrared Physics*, 35, 331-336, 1994.
38. C.L. Bennett, D.J. Fixsen, G. Hinshaw, J.C. Mather, S.H. Moseley, E.L. Wright, R.E. Eplee, Jr., J. Gales, T. Hewagama, R.B. Isaacman, R.A. Shafer, and K. Turpie, "Morphology of the Interstellar Cooling Lines Detected by COBE," *Astrophysical Journal*, 434, 587-598, 1994.
39. W.T. Reach, E. Dwek, D.J. Fixsen, T. Hewagama, J.C. Mather, R.A. Shafer, A.J. Banday, C.L. Bennett, E.S. Cheng, R.E. Eplee, Jr., D. Leisawitz, P.M. Lubin, S.M. Read, F.G.D.

- Shuman, G.F. Smoot, T.J. Sodroski, and E.L. Wright, "Far-Infrared Spectral Observations of the Galaxy by COBE," *Astrophysical Journal* 451, 188-199, 1995.
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147. Mather, John, short article for Chalonge conference, 2012
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Competitive Mission Proposals

1. Co-I on MPF Discovery proposal to NASA, Microlensing Planet Finder, with David Bennett as PI, submitted 2004 and 2006
2. Co-I on WISE (Wide-field Infrared Survey Explorer, previously NGSS, Next Generation Sky Survey), Ned Wright PI. Selected as SMEX mission.

3. COBE mission, 1974 and later versions. Flew in 1989.

Some smaller proposals

1. 2008, Co-I on SLEWS, with Jon Gardner, PI, to do wide survey with warm Spitzer
2. 2008, Co-I on SEDS, with Giovanni Fazio, PI, to do very deep cosmology with warm Spitzer; selected!
3. 2006, Co-PI on IPP proposal (Innovative Partnership Program), “Large Focal Plane Technology For Simultaneous Imaging and Guiding”, with D. Brent Mott (GSFC), Lockheed Martin, Rockwell Scientific, and Conceptual Analytics. Selected, then transferred to Bernard D. Rauscher following Nobel Prize announcement.
4. Numerous proposals (some successful) with Sergei Ipatov, Nick Gor’kavyi, and Leonid Ozernoy to calculate interplanetary dust motions
5. Several proposals, some successful, with Alexander Kashlinsky et al. on structure in the CIB
6. ~ 2001, with Rogier Windhorst, successful, to look for Cosmic IR background in HST deep parallels
7. 2009, co-I with Amber Straughn, observing proposal to VLT, Tracing Galaxy Assembly: A Study of Galaxy Merger Kinematics with SINFONI

Postdocs supervised

1. Michael Wilson, cosmology, now at LANL
2. Leonid Ozernoy, dissident from former Soviet Union, interplanetary dust orbits, deceased
3. Nick Gor’kavyi, from Ukraine, interplanetary dust orbits, now independent contractor
4. Sergei Ipatov, from Moscow, interplanetary dust orbits, Catholic U and Qatar U
5. David Alves, IR stellar astronomy, now independent contractor
6. John Wise, numerical simulations of star and galaxy formation, now at U of Georgia
7. Athena Stacy, numerical simulations of star and galaxy formation

First-Author Talks (not up to date)

1. 2000AAS...197.1902, Mather, J. C. The Future of the Universe, invited talk
2. 2000AAS...196.2301, Mather, J. C. The NGST Science and Program Status, special session
3. National Space Society, Albuquerque, NM, “The Next Generation Space Telescope”, May 28, 2001
4. GSFC Visitor Center, “The Next Generation Space Telescope”, April 26, 2001
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INVITED PAPERS, LECTURES, OR PRESENTATIONS

Invited COBE talks were given at: IAU (Baltimore 1988), AAS (Boston 1988, Washington 1990), NASA GSFC (1990), Fermilab (1990), University of Chicago (1990), Aspen (1990), Princeton University (1990), Institute for Advanced Study (1990), IAU (NASA GSFC 1990), COSPAR (The Hague, 1990), After the First Three Minutes (Maryland, 1990), Cornell (1990), AAS (Washington 1991), Aspen (1991), Princeton (1991), Fermilab (1991), IAU, (Buenos Aires 1991), APS (4/92), General Relativity 13 (Argentina 6/92), Scientist to Scientist Colloquium (8/92), U of Colorado (11/92), Texas Symposium (Berkeley 12/92), AAS (1/93), Global Foundation (1/93), ESTEC Symposium on Frontiers of Space and Ground Based Astronomy (5/93), Conference on Infrared Physics, Switzerland (6/93), Space Telescope Science Institute

Conf for Riccardo Giacconi (5/93), AAS Heinemann Prize lecture (1/94), AAAS (2/94), High Energy Physics, Erice (5/94), Rome cosmology (6/94), Cosmic Background, Erice (9/94)

Press briefings at NASA HQ, JPL, Western Space and Missile Center (1989).

Organizer and lecturer, Resident Research Associate cosmology lecture series, Smithsonian Institution 1991; lecturer, 1993.