

CURRICULUM VITA

Alan Paul Boss

Home page: <https://aboss.dtm.carnegiescience.edu>

Education:

University of California, Santa Barbara, Ph.D. 1979, Physics

University of California, Santa Barbara, M.A. 1975, Physics

University of South Florida, B.S. 1973, Physics

Affiliations:

American Astronomical Society

Division for Planetary Science of the American Astronomical Society

Division on Dynamical Astronomy of the American Astronomical Society

American Geophysical Union

American Association for the Advancement of Science

International Astronomical Union

Meteoritical Society

American Academy of Arts & Sciences

Professional experience:

Staff Member, 1983-present, Carnegie Institution of Washington, Department of Terrestrial Magnetism

Staff Associate, 1981-1983, Carnegie Institution of Washington, Department of Terrestrial Magnetism

Resident Research Associate, 1979-1981, NASA Ames Research Center, Space Science Division

Postdoctoral Researcher, 1979, University of California, Santa Barbara, Department of Physics

Research Assistant, 1974-1979, University of California, Santa Barbara, Department of Physics

Teaching Assistant, 1973-1974, University of California, Santa Barbara, Department of Physics

Miscellaneous:

Undergraduate awards: CRC Freshman Chemistry Award, Outstanding Senior Finalist, B.S. awarded with Honors (3.96/4.00 GPR), graduate of College of Liberal Arts Honors Program

Undergraduate honorary fraternities: Pi Mu Epsilon (mathematics), Sigma Pi Sigma (physics), Omicron Delta Kappa (leadership), Phi Kappa Phi (general)

National Academy of Sciences/National Research Council Postdoctoral Fellow (1979-1981)

Minor Planet (29137) named Alanboss (1987)

Benson Memorial Lecturer, Miami University (2000)

Fellow, American Geophysical Union (2000)

Fellow, American Association for the Advancement of Science (2001)

Fellow, Meteoritical Society (2002)

Fellow, American Academy of Arts & Sciences (2003)

Carnegie Evening Lecturer, Carnegie Institution (2004)
Scottish Universities Physics Alliance Distinguished Visitor (2008)
NASA Group Achievement Award for Astrobiology Roadmap (2008)
Yuval Ne'eman Lecturer & Sackler Distinguished Lecturer, Tel Aviv University (2010)
NASA Group Achievement Award for SIM Planet Finding Capability Study Team (2010)
Carl Seyfert Lecturer, Vanderbilt University (2012)
NASA JPL STAR Award, Jet Propulsion Laboratory Astronomy & Physics Directorate (2017)

History of DTM federal grant support:

NASA — Initial State of the Earth and the Terrestrial Planets (with G.W. Wetherill [PI] and R.W. Carlson) — \$434,000 (1982-1985)
NSF — Theory of Star Formation (with supplement) — \$46,400 (1984-1986)
NASA — The Earliest History of Earth and Moon in the Context of Solar System Formation (with G.W. Wetherill [PI], R.W. Carlson, J.A. Graham, and S.B. Shirey) — \$425,456 (1985-1988)
NSF — Theory of Stellar Formation — \$78,481 (1986-1989)
NASA — Three Dimensional Evolution of the Solar Nebula — \$30,000 (1988-1989)
NSF — Theory of Stellar Formation — \$81,900 (1989-1992)
NASA — Three Dimensional Evolution of the Solar Nebula — \$33,331 (1989 - 8 months)
NASA — Three Dimensional Evolution of the Solar Nebula — \$45,000 (1989-1990)
NASA — Dynamics and Dispersal of the Solar Nebula (with J.A. Graham [PI] and G.W. Wetherill) — \$40,000 (1990-1991)
NASA — Three Dimensional Evolution of the Solar Nebula — \$45,000 (1990-1991)
NASA — Three Dimensional Evolution of the Solar Nebula — \$45,000 (1991-1992)
NASA — Mixing and Transport of Tracers in the Solar Nebula — \$55,000 (1993)
NASA — Three Dimensional Evolution of the Solar Nebula (with augmentation) — \$57,874 (1992-1993)
NASA — Three Dimensional Evolution of the Solar Nebula — \$48,750 (1993-1994)
NSF — Binary Star Formation — \$66,000 (1993-1996)
NASA — Mixing and Transport of Tracers in the Solar Nebula — \$55,000 (1994)
NASA — Dynamical Evolution of Planetary Embryos (with G. W. Wetherill [PI]) — \$35,000 (1994-1995)
NASA — Three Dimensional Evolution of the Solar Nebula — \$50,855 (1994-1995)
NASA — Mixing and Transport of Tracers in the Solar Nebula — \$57,054 (1995)
NASA — Dynamical Evolution of Planetary Embryos (with G. W. Wetherill [PI]) — \$46,686 (1995-1996)
NASA — Chairing the Planetary Systems Science Working Group — \$28,000 (1995-1996)

NASA — Three Dimensional Evolution of the Solar Nebula — \$50,900 (1995-1996)

NASA — Mixing and Transport of Tracers in the Solar Nebula — \$71,873 (1996)

NASA — Three Dimensional Evolution of the Solar Nebula — \$50,900 (1996-1997)

NASA — Mixing and Transport of Tracers in the Solar Nebula — \$74,446 (1997)

NSF — Binary Star Formation — \$78,201 (1997-1999)

NASA — Three Dimensional Evolution of the Solar Nebula — \$52,000 (1997-1998)

NASA — Mixing and Transport of Tracers in the Solar Nebula — \$75,847 (1998)

NASA — Three Dimensional Evolution of the Solar Nebula — \$52,000 (1998-1999)

NASA Astrobiology Institute — Hydrothermal Systems: Physical, Chemical, and Biological Evolution and Cosmic Environments (with S. C. Solomon [PI] and fourteen Co-Is) — \$3,347,200 (1998-2003)

NASA — Gordon Research Conference on Origins of Solar Systems — \$15,000 (1999)

NASA — Mixing and Transport of Tracers in the Solar Nebula — \$80,000 (1999)

NSF — Acquisition of an Alpha Workstation Cluster for Theoretical Studies of the Origin of Stars, Planets, and Life (with Co-Is G. W. Wetherill, G. D. Cody, and G. Saghi-Szabo) — \$400,000 [2/3 NSF, 1/3 CIW] (1999-2003)

NASA — Three Dimensional Evolution of the Solar Nebula — \$49,400 (1999-2000)

NASA — Mixing and Transport of Tracers in the Solar Nebula — \$75,000 (2000)

NSF — Binary Star and Brown Dwarf Formation — \$95,000 (2000-2003)

NASA/JPL — Ball/TPF Study Science Team — \$12,000 (2000-2001)

NASA — Three Dimensional Evolution of the Solar Nebula — \$52,000 (2001)

NASA — Mixing and Transport in the Solar Nebula — \$60,000 (2001)

NASA — Three Dimensional Evolution of the Solar Nebula — \$52,800 (2002)

NASA — Mixing and Transport in the Solar Nebula — \$60,000 (2002)

NASA Astrobiology Institute — Astrobiological Pathways: From the interstellar medium, through planetary systems, to the emergence and detection of life (with S. C. Solomon [PI] and multiple Co-Is) — \$6,308,470 (2003-2008)

NASA — Three Dimensional Evolution of the Solar Nebula — \$52,800 (2003)

NASA — Mixing and Transport in the Solar Nebula — \$60,000 (2003)

NSF — Theoretical Models of Binary Star and Brown Dwarf Formation — \$111,760 (2003-2006)

NASA — Three Dimensional Evolution of the Solar Nebula — \$53,000 (2004)

NASA — Mixing and Transport in the Solar Nebula — \$60,000 (2004)

NSF — Astrometric Camera for Detecting Brown Dwarfs and Gas Giants with the Du Pont Telescope (with Co-Is G. D. Gatewood, S. R. Majewski, I. B. Thompson, and A. J. Weinberger) — \$321,025 [68% NSF, 32% CIW] (2004-2005)

NASA — Three Dimensional Evolution of the Solar Nebula — \$50,000 (2005)

NASA — Mixing and Transport in the Solar Nebula — \$60,000 (2005)

NASA — Three Dimensional Evolution of the Solar Nebula — \$50,000 (2006)

NASA — Mixing and Transport in the Solar Nebula — \$60,000 (2006)

NASA — Solar Nebula Evolution — \$40,000 (2007)

NASA — Mixing and Transport in the Solar Nebula — \$51,000 (2007)

NASA — Solar Nebula Evolution — \$42,500 (2008)

NASA — Mixing and Transport in the Solar Nebula — \$60,000 (2008)

NASA — Independent Verification of SIM Data Generation — \$21,996 (2008)

NASA Astrobiology Institute — Astrobiological Pathways: From the interstellar medium, through planetary systems, to the emergence and detection of life (with G. Cody [PI] and multiple Co-Is) — \$6,977,059 (2008-2014)

NASA — Mixing and Transport in the Solar Nebula — \$60,000 (2009)

NASA — Solar Nebula Evolution — \$42,500 (2009-2011)

NASA — Mixing and Transport in the Solar Nebula — \$60,000 (2010)

NSF — Infrastructure for Interdisciplinary Research in Earth and Space Science at the Carnegie Institution (with S. C. Solomon [PI] and multiple Co-Is) — \$1,093,000 (2010-2015)

NSF — Collapse and Fragmentation of Magnetic Molecular Cloud Cores — \$121,277 (2010-2015)

NASA — Mixing and Transport in the Solar Nebula — \$60,000 (2011)

NASA — Mixing and Transport in the Solar Nebula — \$60,000 (2012-16)

Total federal grant support \$22,326,741

Other grant support:

JPL DDF — Chemistry and Dynamics in Evolving Protostellar Cores and Disks (with W. D. Langer [PI] and M. Allen) — \$120,000 (1993-1995)

Carnegie Canada — What is the Difference Between a Brown Dwarf Star and a Gas Giant Planet? (with Pierre Bastien [Co-I]) — \$40,000 (2002-2003)

NASA Discovery – Kepler: A Search for Terrestrial Planets (with W. Borucki [PI] and twenty-three Science Team members) — \$572,266,000 (2002-2012)

Carnegie Science Venture Grant - C-MOOR: The Carnegie Massive Open Online Research Platform (with F. Tan [co-PI], Z. Nizmai, S. Dieterich, and J. Teske) - \$100,000 (2016-2018)

David W. Thompson Family Fund Carnegie Astrometric Planet Search \$220,000 (2015-)

Doctoral thesis committees:

Elizabeth A. Myhill, University of California, Los Angeles (1991)
Prudence N. Foster, University of Virginia (1993)
Yan Fernandez, University of Maryland (1999)
Grant M. Kennedy, Australian National University (2009)
Johannes Sahlman, University of Geneva, Switzerland (2012)
Oliver Schib, University of Bern, Switzerland (2020-21)

Professional committees:

CIW/Geophysical Laboratory Director Search Committee (1985-86)
NASA Origins of Solar Systems Workshops (1986-87)
NAS/NRC Committee on Cooperation with the USSR on Planetary Sciences (1988-89)
NASA Planetary Systems Science Working Group (1988-91,1994)
CIW/DTM Director Search Committee (1990-92)
NAS/NRC Committee on Planetary and Lunar Exploration (1990-93)
NASA Toward Other Planetary Systems Science Working Group (1991-93)
DDA/AAS Brouwer Award Selection Committee (1992-94)
NASA Origins of Solar Systems Management Operations Working Group (1994-96)
Chair, DDA/AAS Brouwer Award Selection Committee (1994-95)
AAS Warner/Pierce Prize Committee (1995-97)
Chair, NASA Planetary Systems Science Working Group (1995-96)
NASA Keck Review Team (1995-96)
NASA Exploration of Neighboring Planetary Systems (ExNPS) Roadmap Integration Team (1995)
NASA Solar System Exploration Subcommittee (1995)
NASA Astronomical Search for Origins and Planetary Systems Subcommittee (1996-98)
NASA Keck/IRTF Management Operations Working Group (1996-98)
NASA Space Interferometry Mission Science Working Group (1996-2000)
NASA SScAC Task Force on R&A and MO&DA (1997-98)
NASA Astrobiology Roadmap Team (1998)
Chair, NASA Origins of Solar Systems Management Operations Working Group (1998-2001)
External Review Committee, Space Science Division, NASA Ames Research Center (1999)
Chair, IAU Working Group on Extrasolar Planets (2000-03)
Chair, NASA Origins and Evolution of Solar System Bodies Operations Working Group (2000-01)
NASA Planetary Geology and Geophysics Management Operations Working Group (2001-03)
NASA Astrobiology Roadmap Team (2001-02)
Co-Chair, DTM-GL Experiment Building Renovation Committee (2001-03)
NASA Kepler Mission Science Team (2001-12)
AAAS Electorate Nominating Committee of Section on Astronomy (2002-05)

NASA Navigator Program Independent Review Team (2002-05)
Chair, OCIW Director Search Committee (2002)
Chair, NASA TPF Precursor Science Roadmap Advisory Group (2003)
Organizing Committee, Division III, International Astronomical Union (2003-)
Vice President, Commission 51: Bioastronomy, International Astronomical Union (2003-06)
Chair, IAU Working Group on Extrasolar Planets (2003-06)
IAU Working Group on the Definition of a Planet (2004-05)
NASA Navigator Program External Independent Readiness Board (2005-08)
President, Commission 51: Bioastronomy, International Astronomical Union (2006-09)
Vice President, Commission 53: Extrasolar Planets, International Astronomical Union (2006-09)
Co-Chair, NASA Astrobiology Institute Planetary System Formation Focus Group (2008-11)
NASA ExoPlanet Exploration Program External Independent Readiness Board (2008-09)
NASA Kepler Mission Science Council (2008-09)
President, Commission 53: Extrasolar Planets, International Astronomical Union (2009-12)
Past President, Commission 51: Bioastronomy, International Astronomical Union (2009-12)
Chair-Elect, AAAS Section on Astronomy (2009-10)
NAS/NRC Astro 2010 Decadal Survey, EOS Program Prioritization Panel (2009-10)
Chair, AAAS Section on Astronomy (2010-11)
NASA Exoplanet Exploration Program Technology Assessment Committee (2010-13)
Chair, NASA Astrophysics Subcommittee, NASA Advisory Council (2010-12)
NASA Science Committee, NASA Advisory Council (2010-12)
NASA Star and Exoplanet Database User's Group (2010-11)
Past Chair, AAAS Section on Astronomy (2011-12)
NASA Astrobiology Roadmap Team (2013)
Chair, NASA Astrophysics Focused Telescope Assets Coronagraph Technology Assessment Committee (2013-17)
Chair, NASA Exoplanet Exploration Program Technology Assessment Committee (2013-)
Spanish Planetology and Astrobiology Network International Science Committee (2014-)
Chair, NASA Astrophysics Focused Telescope Assets IR Detectors Technology Assessment Committee (2014-17)
Carnegie Institution Scientific Computing Advisory Committee (2014-16)
Chair, Carnegie Observatories Director Search Committee (2014-15)
NASA Astrophysics Subcommittee, NASA Advisory Council (2015-17)
Chair, NASA Exoplanet Exploration Program Analysis Group (2015-18)
Founding Member, NASA Nexus for Exoplanet System Science Network (2015-)
Chair, Carnegie Institution Space Earth Life Book Advisory Committee (2016-)
NASA Astrophysics Advisory Committee, NASA Astrophysics Division (2017-19)
NAS/NRC Committee on the State of the Science of Astrobiology (2017-18)
Past Chair (Emeritus), NASA Exoplanet Exploration Program Analysis Group (2018-19)

Chair, NASA Independent Review Team, Roman Space Telescope Coronagraphic Instrument (2018-23)
NASA Exoplanet Exploration Program Science Interest Group on Demographics (2018-)
Chair, G-CLEF Management Advisory Board (2020-)

Conference and volume organization committees:

Scientific Organizing Committee, IAU Symposium #147, Grenoble (1988-90)
Steering Committee, Clemson Workshop on Isotopic Anomalies (1989-90)
Chair, Organizing Committee, Symposium on Time Scales & Solar System Formation [in honor of George W. Wetherill] (1990-91)
Scientific Organizing Committee, First International Conference on Formation, Evolution, and Detection of Planetary Systems (1992)
Organizing Committee, JPL/Caltech Summer School for Planetary Science (1992)
Program Committee, Workshop on Isotopic Anomalies, Washington University (1993)
Organizing Committee, Clouds, Cores, and Low Mass Stars, Fourth Haystack Observatory Conference (1994)
Organizing Committee, Chondrules as Probes of Protoplanetary Disks, University of New Mexico (1993-94)
Organizing Committee, Division of Planetary Sciences Meeting, Washington, D.C. (1993-94)
Scientific Organizing Committee, Workshop on Galactic Star Formation and Early Stellar Evolution, Ringberg Castle, Germany (1994-95)
Organizing Committee, Meteoritical Society Washington Meeting (1992-95)
Organizing Committee, From Stardust to Planetesimals, NASA Ames Research Center, Santa Clara, California (1995-96)
Scientific Organizing Committee, Planetary Formation in the Binary Environment, State University of New York, Stony Brook (1995-96)
Vice-Chair, Gordon Research Conference on Origins of Solar Systems, New England College, Henniker, New Hampshire (1995-97)
Co-Chair, Protostars and Planets IV Conference (Co-Editor, book), University of California, Santa Barbara (1996-98)
Scientific Organizing Committee, The International Origins Conference, Estes Park, Colorado (1996-97)
Scientific Organizing Committee, Numerical Astrophysics 1998, Tokyo, Japan (1997-98)
Organizing Committee, Origin of the Earth and Moon Conference, Monterey, California (1996-1998)
Scientific Organizing Committee, Euroconference on Extrasolar Planets, Lisbon, Portugal (1997-1998)
Chair, Gordon Research Conference on Origins of Solar Systems, New England College, Henniker, New Hampshire (1997-99)
Scientific Organizing Committee, IAU Symposium 200: The Formation of Binary Stars, Potsdam, Germany (1999-2000)
Scientific Organizing Committee, IAU Symposium 202: Planetary Systems in the Universe – Observation, Formation and Evolution, Manchester, England (1999-2000)
Program Committee, Division of Planetary Sciences Meeting, Pasadena, California (2000)
Chair, Program Committee, Second NASA Astrobiology Institute General Meeting, Washington, D.C. (2001)
Scientific Organizing Committee, Second Astrobiology Science Conference, NASA Ames Research Center, California (2001-02)

Scientific Organizing Committee, Scientific Frontiers in Research on Extrasolar Planets, Washington, D.C. (2001-02)

Scientific Advisory Committee, Protostars and Planets V, Kohala, Hawaii (2002-05)

Scientific Organizing Committee, IAU Symposium 219: The Stars Are Suns: Activity, Evolution, and Planets, Sydney, Australia (2002-03)

Scientific Organizing Committee, Meteorites and the Early Solar System II, University of Arizona Space Science Series (2002-04)

Chair, Scientific Organizing Committee, Bioastronomy 2004, Iceland (2003-04).

Organizing Committee, Workshop on Chondrites and the Protoplanetary Disk, Kauai (2003-04).

Scientific Organizing Committee, Planet Formation 2005: Theory Meets Observation, Ringberg Castle, Bavaria, Germany (2004-05).

Scientific Organizing Committee, Fourth Astrobiology Science Conference, Washington, D.C. (2004-06)

Program Organizing Committee, Pale Blue Dot III: Terrestrial to Astronomical Biosignatures, Adler Planetarium, Chicago, Illinois (2005-06)

Scientific Organizing Committee, IAU Symposium No. 249 on Exoplanets: Physics, Dynamics, and Evolution, China (2005-07)

Scientific Organizing Committee, Nobel Symposium on Physics of Planetary Systems, Stockholm, Sweden (2006-07)

Scientific Organizing Committee, Bioastronomy 2007: Molecules, Microbes, and Extraterrestrial Life, Puerto Rico, (2006-07).

Science Steering Committee, Fifth Astrobiology Science Conference, Santa Clara, California (2007-08)

Scientific Organizing Committee, Exoplanets, University of Arizona Space Science Series (2008-2010)

Science Program Committee, Searching for Life Signatures, International Academy of Astronautics, Paris, France (2008)

Co-Editor and Scientific Organizing Committee, IAU Special Session on Planetary Systems as Potential Sites for Life, IAU General Assembly, Rio de Janeiro, Brazil (2008-09)

Co-Editor and Scientific Organizing Committee, IAU Symposium #276 on the Astrophysics of Planetary Systems - Formation, Structure, and Dynamical Evolution, Torino, Italy (2009-2010)

Scientific Organizing Committee, Origins 2011: Joint Meeting of IAU Commission 51 on Bioastronomy and ISSOL, Montpellier, France (2009-2011)

Scientific Organizing Committee, Frontier Science Opportunities with the James Webb Space Telescope, Baltimore, Maryland (2010-2011)

Scientific Organizing Committee, First Kepler Science Conference, NASA Ames Research Center, Moffett Field, California (2010-2011)

Scientific Advisory Committee, IAU Symposium #293: Formation, Detection, and Characterization of Extrasolar Habitable Planets, IAU 28th General Assembly, Beijing, China (2010-2012)

Chair, Local Organizing Committee, Sean Solomon Scientific Symposium, DTM, Carnegie Institution, Washington, D.C. (2010-2011)

Scientific Organizing Committee, IAU Special Session #10: Dynamics of the Star-Planet Relations, IAU 28th General Assembly, Beijing, China (2011-2012)

Scientific Advisory Committee, Protostars and Planets VI, Heidelberg, Germany (2011-2013)

Co-Chair, Scientific Organizing Committee, Second Kepler Science Conference, NASA Ames Research Center, Moffett Field, California (2013)

Scientific Organizing Committee, Sagan Exoplanet Summer Workshop on Microlensing in the Era of WFIRST, Pasadena, California (2016-17)

Scientific Organizing Committee, Chesapeake Bay Area Exoplanet Meetings, Washington, D.C. (2017-)
Scientific Organizing Committee, Green Bank Observatory Meeting on Astrobiology, Green Bank, West Virginia (2019)

Editorial positions:

Series Editor (with C. Cockell, B. Jakosky, D. Prieur, and F. Westall) Cambridge Astrobiology Series, Cambridge University Press (2001-)

Editorial Board, Star Formation Newsletter (2012-20)

Review panels:

NASA Astrophysical Theory Review Panel (1987)

NASA Origins of Solar Systems Review Panels (1989-91)

Group Chief (Observations), NASA Origins of Solar Systems Review Panel (1993)

NASA Lunar and Planetary Geosciences Review Panels (1993-94)

Chair, NASA Origins of Solar Systems Review Panels (1994-96)

NASA Hubble Space Telescope Allocation Committee (1995)

NASA Keck Telescope Allocation Committee (1996)

NASA Discovery 5 Mission Review Panel (1997)

Panel Chair, NASA Astrophysical Theory Review Panel (1997)

Panel Chair, NSF Stellar Astronomy and Astrophysics Review Panel (1997)

NSF Astronomy Division Career Program Review Panel (1998)

NSF/NASA Joint NStars/SIM Review Panel (1999)

NASA Michelson Fellowship Program Review Board (2000)

Chair, NASA Origins/Evolution Cluster Junior Review, Office of Space Science (2000)

Subpanel Chair, NASA Astrobiology Institute Review Panel, Cycle 2 (2000)

Group Chief (Dynamics), NASA Planetary Geology and Geophysics Review Panel (2001-02)

NASA Explorer Mission Review Panel (2002)

NASA Exobiology Program Review Panel (2002)

Chair, NASA Exobiology Program Review Panel (2003-then schedule conflict)

NASA ADP/LTSA Program Review Panel (2004)

Carnegie Observatories Telescope Assignment Committee (2005)

Chair, NASA Interdisciplinary Exploration Science Review Subpanel (2005)

Chair, NASA Astrobiology Science and Technology Instrument Development Review Panel, Astronomy and Missions Subpanel (2006)

Chair, NASA Origins of Solar Systems Review Panels (2006-07)

Group Chair, NASA SOFIA Second Generation Instrument Science Peer Review Panel (2011-12)

NSF Galactic Astronomy Program Review Panel (2012)

Carnegie Observatories Telescope Assignment Committee (2012-13)

Chair, Carl Sagan Fellowship Committee, NASA Exoplanet Science Institute, Pasadena, California (2012-13)
Chair, NASA Astrophysics Research and Analysis: Strategic Astrophysics Technology Review Subpanel (2013)
Chair, NASA Solar System Exploration Research Virtual Institute: Dynamics/NEO Characterization Review Subpanel (2013)
Carnegie Observatories Telescope Assignment Committee (2013-14)
Chair, Carl Sagan Fellowship Committee, NASA Exoplanet Science Institute, Pasadena, California (2013-14)
Chair, NASA WFIRST Coronagraph Preparatory Science Review Panel (2014)
Carnegie Science Venture Review Panels (2016-18)
Carnegie Observatories Telescope Assignment Committee (2018-19)
Carnegie Science Venture Review Panel (2020)