Index: Guidance to NASA Research Funding Charts

USC MAPS

http://web-app.usc.edu/web/ra_maps

The DC Office of Research Advancement has created the Federal Mission Agency Program Summaries (MAPS) website to:

1. Connect PIs with appropriate funding agency programs/program officers
2. Assist in development of white papers/charts/elevator pitches

The website can be accessed using one's USC NetID and Password.

It has the following resources:

1. *Search Tab* for a searchable database of programs/program officers
   At that website one can do keyword searches to locate the associated mission agency (DHS, DOD, DOE, DOT, ED, EPA, INTEL, NASA, NIST, NOAA and USDA) programs and program officers.

2. *Mission Agency Tab* (DHS, DHHS, DOD, DOJ, DOE, DOT, ED, EPA, INTEL, NASA, NIST, NOAA, USDA)
   Guide to Agency Funding for FYXX
   Agency Research Program Charts
   Agency Planning Documents
   Chart numbers in the text above reference the Agency Research Program Chart files.

3. *Presentation Tab* for charts from recent USC Center of Excellence in Research workshops

4. *Proposal Tab* for report / guides on writing proposals

5. *Email Alerts Tab* for URLs at which one can arrange for automatic solicitation updates

6. *Grantee Tab* for URLs at which one can find previous agency awardees

7. *Visiting DC Tab* for information about DC Office services

NASA Research Opportunities - Budget Request for FY2016

(NSPIRES web site http://nspires.nasaprs.com/external/)

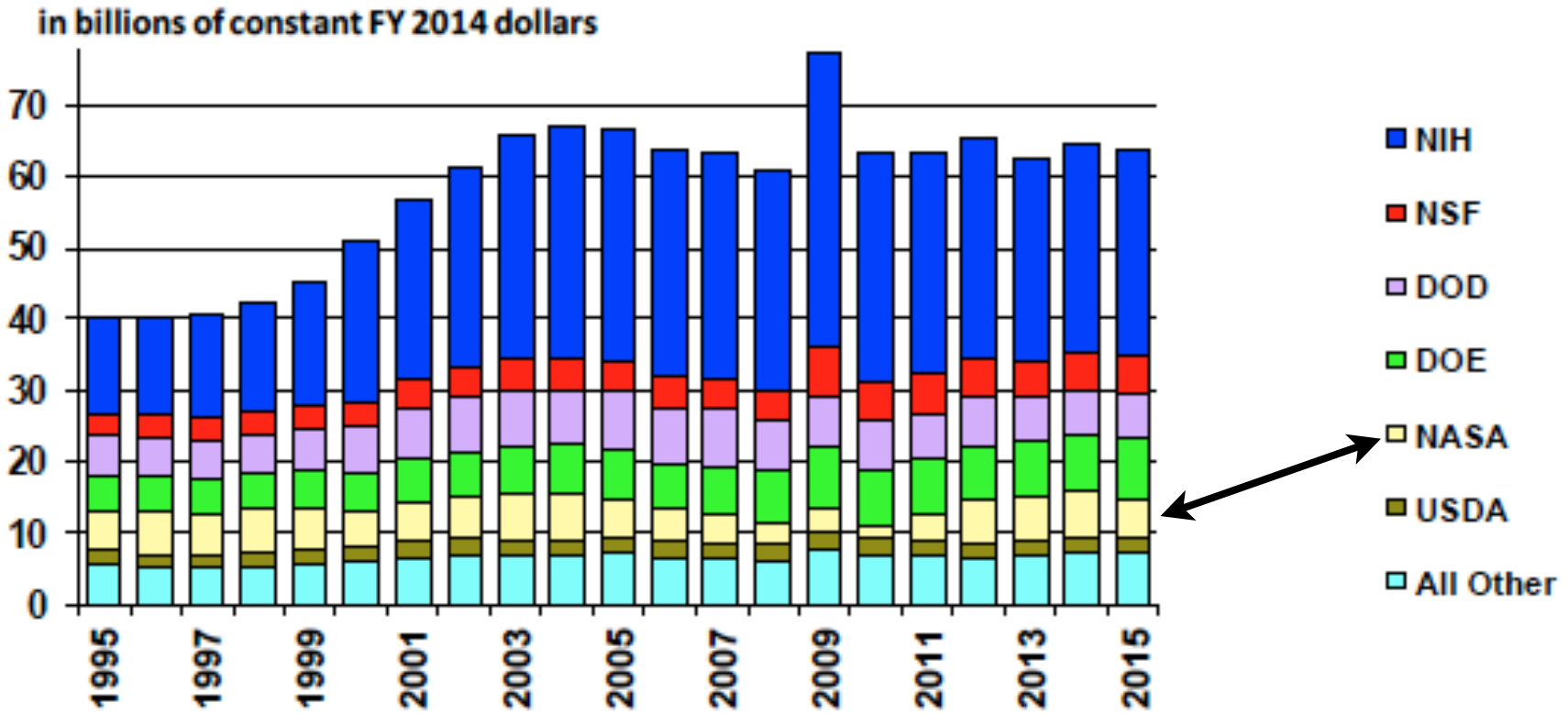
- Science Mission Directorate (SMD) www.science.nasa.gov/
  - Heliophysics Research and Analysis $ 34M
  - Astrophysics Research and Analysis $ 72M
  - Earth Science Research and Analysis $348M
  - Planetary Science Research and Analysis $163M
- Aeronautics Research Mission Directorate (ARMD) www.aeronautics.nasa.gov/
  - Airspace Operations and Safety $142M
  - Advanced Air Vehicles Program $241M
  - Integrative Aviation Systems $ 96M
  - Transformative Aeronautics Concepts $ 92M
- Human Exploration and Operations Mission Directorate (HEO) www.nasa.gov/directorates/heo/home/index.html
  - Human Research Program $168M
- Space Technology Mission Directorate www.nasa.gov/directorates/spacetech/home/index.html
  - Space Technology Research and Development $491M
- Office of Education www.nasa.gov/offices/education/contacts/hqdirectory.html
  - Aerospace Research and Career Development $ 33M
  - STEM Education and Accountability $ 56M

The four directorates each promulgate annual NASA Research Announcements (NRA) for competitive proposals:

SMD	Research Opportunities in Space and Earth Science (ROSES)
	Stand Alone Mission of Opportunity Notice (SALMON)
ARMD	Research Opportunities in Aeronautics (ROA)
HEO	Res & Technol Development to Support Crew Health & Performance in Space Exploration Missions
STMD	NASA Innovative Advanced Concepts (NIAC)
	Space Technology Research Grants (STRG)

NASA as part of Federal "Basic and Applied Research" Funding

Federal Research by Agency, FY 1995-2015



FY 2009 figures include Recovery Act appropriations.
Research includes basic research and applied research.
FY 2015 figures exclude Opportunity, Growth, and Security Initiative proposals.

NASA

Solicitation and Proposal Integrated Review and Evaluation System (NSPIRES)

This web-based system supports NASA research from the release of solicitation announcements through the peer review and selection processes. The system is intended to facilitate conducting research business with NASA for the science and technology research community.

NSPIRES is the web interface that most scientists use to submit proposals to the Science Mission Directorate. There are tutorials on the NSPIRES pages, in addition this website a few pointers here that have come up recently with tragic consequences.

- NSPIRES basics: how to register
- NSPIRES basics: adding team members
- NSPIRES basics: release and submit proposal
- NSPIRES warnings and errors: why can't I submit
- NSPIRES budgets: CS labor in NSPIRES cover pages

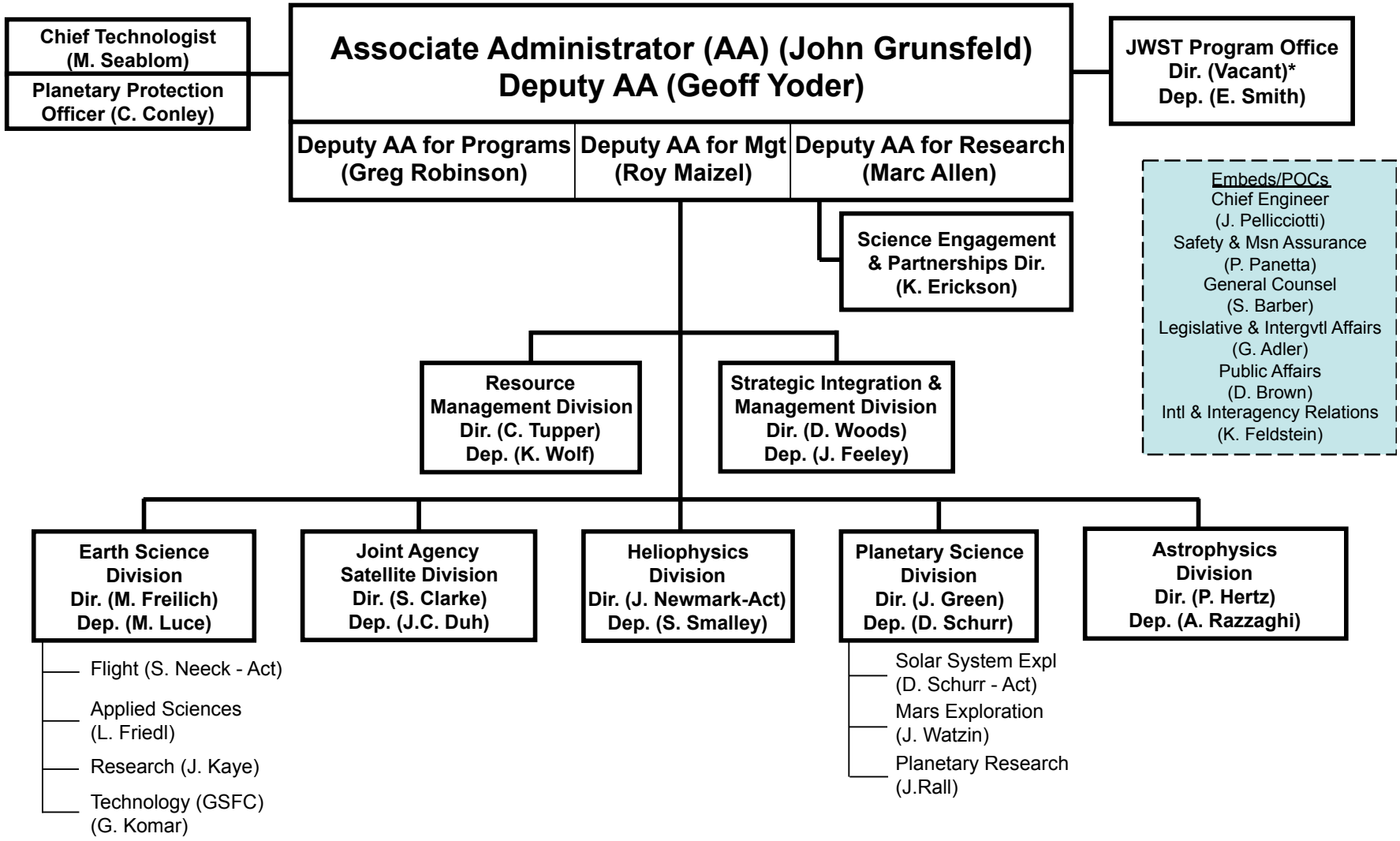
NSPIRES Helpful Hints http://science.nasa.gov/researchers/sara/how-to-guide/maxs-nspires-helpful-hints/

NSPIRES Help http://nspires.nasaprs.com/external/help.do;jsessionid=ByYyN4mNWLKHvYVJd5CJWmJGLnQ2TdtJR0WyGyqQTXkcV216g6Gp!1254946340!-1407319094!7006!-1!-1909677563!-1407319093!7006!-1

NASA e-mail alerts to new opportunities can be arranged at:
http://spacescience.nasa.gov/announce/listserv.htm

NASA Science Mission Directorate Organization Chart

SMD Organization



* Direct report to NASA Associate Administrator

February 2015

NASA Science Mission Directorate (SMD)
Research Announcement (NRA): NNH15ZDA001N

Research Opportunities in Space and Earth Sciences (ROSES)

What:

ROSES "appendices" are issued during the year with detailed description of programs, program officers and due dates for:

- A: Earth Sciences
- B: Heliophysics
- C: Planetary Science
- D: Astrophysics
- E: Cross-Division

The typical period of performance for an award is three to five years

NASA uses a peer review process to evaluate and select research proposals submitted in response to these research announcements.

Statistics on awards - http://science.nasa.gov/researchers/sara/grant-stats/

How Much:

Awards range from under $100K per year for focused, limited efforts (e.g., data analysis) to more than $1M per year for extensive activities (e.g., development of science experiment hardware).

When: Varying dates - notice of intent (NOI) and proposal due dates are provided in the ROSES announcement and amendments

Where: http://nasascience.nasa.gov/researchers
http://nasascience.nasa.gov/researchers/sara/program-officers-list
http://nspires.nasaprs.com/external/

NASA Science Mission Directorate

Earth Science Division (ESD)

http://nasascience.nasa.gov/earth-science/focus-areas/

The following sections describe each Science Focus Area. Each section describes the scientific field, NASA's current contribution, and next major steps in the period 2007-2016.

- **Atmospheric Composition**
  Atmospheric Composition is focused on the composition of Earth's atmosphere in relation to climate prediction, solar effects, ground emissions and time.

- **Weather**
  Our weather system includes the dynamics of the atmosphere and its interaction with the oceans and land. The improvement of our understanding of weather processes and phenomena is crucial in gaining an understanding of the Earth system.

- **Climate Variability & Change**
  NASA's role in climate variability study is centered around providing the global scale observational data sets on oceans and ice, their forcings, and the interactions with the entire Earth system.

- **Water & Energy Cycle**
  Through water and energy cycle research we can improve hurricane prediction, quantify tropical rainfall and eventually begin to balance the water budget at global and regional scales.

- **Carbon Cycle & Ecosystems**
  This Focus Area deals with the cycling of carbon in reservoirs and ecosystems as it changes naturally, is changed by humans, and is affected by climate change.

- **Earth Surface & Interior**
  The goal of the Earth Surface and Interior focus area is to assess, mitigate and forecast the natural hazards that affect society, including earthquakes, landslides, coastal and interior erosion, floods and volcanic eruptions.

2015 NASA SMD ROSES NRA
Appendix (topics) A - Earth Science

	Program	POC	Org	Email	Tel
A1	Earth Science Overview				
A2	Land-Cover / Land-Use Change	Dr. Garik Gutman	ESD/SMD	ggutman@nasa.gov	202 358 0276
A3	Ocean Biology and Biogeochemistry	Dr. Paula Bontempi	ESD/SMD	paula.s.bontempi@	202 358 1508
A4	Terrestrial Ecology	Dr. Eric Kasischke	ESD/SMD	eric.s.kasischke@	202 358 0245
A5	Carbon Cycle Science	Dr. Paula Bontempi	ESD/SMD	paula.s.bontempi@	202 358 0245
A6	Biodiversity	Dr. Woody Turner	ESD/SMD	woody.turner@	202 358 1662
A7	Carbon Monitoring system	Dr. Kenneth Jucks	ESD/SMD	kenneth.w.jucks@	202 358 0476
A8	Physical Oceanography	Dr. Eric Lindstrom	ESD/SMD	eric.j.lindstrom@	202 358 4540
A9	Ocean Salinity Field Campaign	Dr. Eric Lindstrom	ESD/SMD	eric.j.lindstrom@	202 358 4540
A10	Surface Water and Ocean Topography Science Te	Dr. Eric Lindstrom	ESD/SMD	eric.j.lindstrom@	202 358 4540
A11	Ocean Surface Topography Science Team	Dr. Eric Lindstrom	ESD/SMD	eric.j.lindstrom@	202 358 4540
A12	Ocean Vector Winds Science Team	Dr. Eric Lindstrom	ESD/SMD	eric.j.lindstrom@	202 358 4540
A13	Modeling, Analysis and Prediction	Dr. David Considine	ESD/SMD	david.b.considine@	202 358 2277
A14	Cryospheric Science	Dr. Thomas Wagner	ESD/SMD	thomas.wagner@	202 358 4682
A15	IceBridge Research	Dr. Thomas Wagner	ESD/SMD	thomas.wagner@	202 358 4682
A16	Upper Atmosphere Research Program and Aura S	Dr. Kenneth Jucks	ESD/SMD	kenneth.w.jucks@	202 358 0476
A17	Radiation Sciences Program	Dr. Hal Maring	ESD/SMD	hal.maring@	202 358 1679
A18	Atmos Comp: Modeling and Analysis	Dr. Richard Eckman	ESD/SMD	richard.s.eckman@	202 358 2567
A19	KORUS-AQ: International Cooperative Air Quality	Dr. Alex Pszenny	ESD/SMD	alex.pszenny@	202 358 4811
A20	Terrestrial Hydrology	Dr. Jared K. Entin	ESD/SMD	jared.k.entin@	202 358 0275
A21	NASA Energy and Water Cycle Study	Dr. Jared K. Entin	ESD/SMD	jared.k.entin@	202 358 0275
A22	Science Utilization of the Soil Moisture Active=Pa	Dr. Jared K. Entin	ESD/SMD	jared.k.entin@	202 358 0275
A23	Precipitation Measurement Missions Science Tean	Dr. Ramesh K. Kakar	ESD/SMD	ramesh.k.kakar@	202 358 0240
A24	Weather Focus Area	Dr. Tsengdar Lee	ESD/SMD	tsengdar.j.lee@	202 358 0860
A25	Earth Surface and Interior	Dr. Benjamin Phillips	ESD/SMD	ben.phillips@	202 358 5693
A26	Rapid Response and Novel Research in Earth Scie	Dr. Thomas Wagner	ESD/SMD	thomas.wagner@	202 358 4682
A27	GRACE and GRACE-FO Science Team	Dr. Lucia Tsaoussi	ESD/SMD	lucia.s.tsaoussi@	202 358 4471
A28	Space Archaeology	Mr. Craig Dobson	ESD/SMD	craig.dobson@	202 358 0254
A29	Airborne Inst Technol Transition	Dr. Jack Kaye	ESD/SMD	jack.a.kaye@	202 358 2559
A30	Earth Science US Participating Investigator	Dr. Richard Eckman	ESD/SMD	richard.s.eckman@	202 358 2567
A31	Interdisciplinary Research in Earth Science	Dr. Jack Kaye	ESD/SMD	jack.a.kaye@	202 358 2559
A32	NASA Data for Operation and Assessment	Dr. Tsengdar Lee	ESD/SMD	tsengdar.j.lee@	202 358 0860
A33	CloudSat and CALIPSO Science Team Recompete	Dr. David Considine	ESD/SMD	david.b.considine@	202 358 2277
A34	Sateliite Calibration Interconsistency Studies	Dr. Lucia Tsaoussi	ESD/SMD	lucia.s.tsaoussi@	202 358 4471
A35	New (Early Career) Investigator in Earth Science	Dr. Ming-Ying Wei	ESD/SMD	ming-ying.wei-1@	202 358 0771
A36	Advancing Collaborative Connections for Earth Sc	Mr. Curt Tilmes	ESD/SMD		202 358 1757
A37	Making Earth System Data Records for use in Res	Dr. Lucia Tsaoussi	ESD/SMD	lucia.s.tsaoussi@	202 358 4471
A38	Computational Modeling Algorithms and Cyber in	Dr. Tsengdar Lee	ESD/SMD	tsengdar.j.lee@	202 358 0860
A39	Advanced Information Systems Technology	Mr. Michael Little	ESTO/SMD	michael.m.little@	210 286 7404
A40	Instrument Incubator	Mr. Parminder Ghuman	ESTO/SMD	p.ghuman@	301 286 8001
A41	Advanced Component Technology	Mr. Joseph Famiglietti	ESTO/SMD	joseph.famiglietti-1@	201 286 1833
A42	In-Space Validation of Earth Science Technologie	Ms Pamela Millar	ESTO/SMD	pamela.s.millar@	310 286 0016

NASA Science Mission Directorate

Heliophysics Division (HD)

http://nasascience.nasa.gov/heliophysics/focus-areas/

Heliophysics research and exploration focuses on studying the Sun, the heliosphere, and planetary environments as elements of a single, interconnected system, one that contains dynamic space weather and evolves in response to solar, planetary, and interstellar conditions. Such an understanding represents not just a grand intellectual accomplishment for our times —it also provides knowledge and predictive capabilities essential to future utilization and exploration of space.

- **Heliosphere**
  Plasmas and their embedded magnetic fields affect the formation, evolution and destiny of planets and planetary systems. The heliosphere shields the solar system from galactic cosmic radiation. Our habitable planet is shielded by its magnetic fi eld, protecting it from solar and cosmic particle radiation and from erosion of the atmosphere by the solar wind. Planets without a shielding magnetic field, such as Mars and Venus, are exposed to those processes and evolve differently. And on Earth, the magnetic field changes strength and configuration during its occasional polarity reversals, altering the shielding of the planet from external radiation sources.

- **Magnetospheres**
  Determine changes in the Earth's magnetosphere, ionosphere, and upper atmosphere in order to enable specification, prediction, and mitigation of their effects. Heliophysics seeks to develop an understanding of the response of the near-Earth plasma regions to space weather. This complex, highly coupled system protects Earth from the worst solar disturbances while redistributing energy and mass throughout.

- **Space Environment**
  Understand the causes and subsequent evolution of solar activity that affects Earth's space climate and environment. The climate and space environment of Earth are significantly determined by the impact of plasma, particle, and radiative outputs from the Sun. Therefore, it is essential to understand the Sun, determine how predictable solar activity truly is, and develop the capability to forecast solar activity and the evolution of disturbances as they propagate to Earth.

2015 NASA SMD ROSES NRA
Appendix B - Heliophysics

	Program	POC	Org	Email	Tel
B1	Heliophysics Research Program Overview				
B2	Heliophysics Supporting Research	Dr. Elsayed Talaat	HD/SMD	elsayed.r.talaat@	202 358 3804
B3	Heliophysics Technology and Instrumentation De	Dr. Elsayed Talaat	HD/SMD	elsayed.r.talaat@	202 358 3804
B4	Heliophysics Guest Investigators	Dr. William Paterson	HD/SMD	william.r.paterson@	202 358 0991
B5	Heliophysics Grand Challenges Research	Dr. Arik Posner	HD/SMD	arik.posner@nasa.gov	202 358 0727
B6	Heliophysics Living with a Star Science	Dr. Madhulika Guhathakurta	HD/SMD	Madhulika.Guhathakurta@	202 358 1992
B7	Heliophysics Infrastructure and Data Environmen	Dr. Jeffrey Hayes	HD/SMD	jhayes@	202 358 0353

NASA Science Mission Directorate

Planetary Science Division (PSD)

http://nasascience.nasa.gov/planetary-science/focus-areas/

Understanding the planets and small bodies that inhabit our solar system help scientists answer questions about its formation, how it reached its current diverse state, how life evolved on Earth and possibly elsewhere in the solar system, and what characteristics of the solar system lead to the origins of life.

- **Inner Solar System**
  The rocky planets of the inner Solar System are Mercury, Venus, Earth, and Mars. Learn more about how NASA Science is studying these planets.

- **Outer Solar System**
  The giant planets of the outer solar system—Jupiter, Saturn, Uranus, and Neptune—and their rings and moons and the ice dwarfs (e.g., Pluto, Charon, Sedna) beyond them hold many clues to the origin and evolution of our solar system as well as providing exciting opportunities for the search for habitable environments.

- **Small Bodies of the Solar System**
  NASA's Planetary Science missions to comets, asteroids and other small bodies help to expand our knowledge by providing close in observations of the small remnant pieces of the solar system's formation, revealing clues about the solar system's early history and evolution and how life came to exist on Earth.

2015 NASA SMD ROSES NRA
Appendix C - Planetary Science

	Program	POC	Org	Email	Tel
C1	Planetary Science Research Program Overview				
C2	Emerging Worlds	Dr. Jeffrey Grossman	PSD/SMD	HQ-Cosmo@mail.	202 358 1218
C3	Solar System Workings	Dr. Mary Voytek	PSD/SMD	mvoytek@hq.nasa.gov	202 358 1577
C4	Habitable Worlds	Dr. Mitchell Schulte	PSD/SMD	mitchell.d.schulte@	202 358 2127
C5	Exobiology	Dr. Michael New	PSD/SMD	michael.h.new@	202 358 1766
C6	Solar System Observations	Dr. Kelley Fast	PSD/SMD	kelly.e.fast@	202 358 0768
C7	Planetary Data Archiving, Restoration and Tools	Dr. Sarah Noble	PSD/SMD	sarah.k.noble@	202 358 5862
C8	Lunar Data Analysis	Dr. Robert Fogel	PSD/SMD	rfogel@	202 358 2289
C9	Mars Data Analysis	Dr. Mitchell Schulte	PSD/SMD	mitchell.d.schulte@	202 358 2127
C10	Cassini Data Analysis	Dr. Jared Leisner	PSD/SMD	HQ-CDAP@mail.nasa.gov	202 358 2016
C11	Discovery Data Analysis	Dr. Christina Richey	PSD/SMD	christina.r.richey@	202 358 2206
C12	Planetary Instrument Concepts for Solar	Dr. James Gaier	PSD/SMD	james.r.gaier@	260 579 3442
C13	Maturation of Inst for Solar	Dr. Janice L. Buckner	PSD/SMD	janice.l.buckner@	202 358 0813
C14	Planetary S&T through Analog Research	Dr. Sarah Noble	PSD/SMD	sarah.k.noble@	202 358 5862
C15	Planetary Protection Research	Dr. Catharine Conley	PSD/SMD	HQ-PPR@mail.	202 358 3912
C16	Early Career Fellowship	Dr. Mary Voytek	PSD/SMD	mvoytek@hq.nasa.gov	202 358 1577
C17	Planetary Major Equipment	Dr. Jeffrey Grossman	PSD/SMD	HQ-PME@mail.	202 358 1218
C18	Laboratory Analysis of Returned Samples	Dr. Jeffrey Grossman	PSD/SMD	HQ-LARS@mail.	202 358 1218
C19	HAyabusa2 Participating Scientist Program	Dr. Tony Carro	PSD/SMD	anthony.carro-1@	202 358 0349

NASA Science Mission Directorate

Astrophysics Division (AD)

http://nasascience.nasa.gov/astrophysics/focus-areas/

The Astrophysics Division has laid out a strategy to discover the origin, structure, evolution of our cosmos.

- **Planets Around Other Stars**
  In the early 1990's radio and optical astronomers detected small changes in stellar emission which revealed the presence of first a few, and now many, planetary systems around other stars. We call these planets "exoplanets" to distinguish them from our own solar system neighbors.
- **The Big Bang**
  The 1929 discovery by Edwin Hubble that the Universe is in fact expanding at enormous speed was revolutionary. The Universe must have been born in this single violent event which came to be known as the "Big Bang."
- **Dark Energy, Dark Matter**
  What is dark energy? More is unknown than is known — we know how much there is, and we know some of its properties; other than that, dark energy is a mystery — but an important one. Roughly 70% of the Universe is made of dark energy. Dark matter makes up about 25%. T
- **Stars**
  How do stars form and evolve? The age, distribution, and composition of the stars in a galaxy trace the history, dynamics, and evolution of that galaxy. Moreover, stars are responsible for the manufacture and distribution of heavy elements such as carbon, nitrogen, and oxygen, and their characteristics are intimately tied to the characteristics of the planetary systems that may coalesce about them.
- **Galaxies**
  Our galaxy, the Milky Way, is typical: it has hundreds of billions of stars, enough gas and dust to make billions more stars, and about six times as much dark matter as all the stars and gas put together. And it's all held together by gravity. Like more than two-thirds of the known galaxies, the Milky Way has a spiral shape. At the center of the spiral, a lot of energy and, occasionally, vivid flares are being generated.
- **Black Holes**
  In recent years, NASA instruments have painted a new picture of these strange objects that are, to many, the most fascinating objects in space.

2014 NASA SMD ROSES NRA
Appendix D - Astrophysics

		POC	Org	Email	Tel
D1	Astrophysics Research Program Overview				
D2	Astrophysics Data Analysis	Dr. Douglas Hudgins	AD/SMD	douglas.m.hudgins@	202 358 0988
D3	Astrophysics Research and Analysis	Dr. Michael Garcia	AD/SMD	michael.r.garcia@nasa.gov	202 358 1053
D4	Astrophysics Theory	Dr. Keith MacGregor	AD/SMD	keith.b.macgregor@	202 358 2463
D5	Swift Guest Investigator Cycle 11	Dr. Martin Still	AD/SMD	martin.still@	202 358 4462
D6	Fermi Guest Investigator - Cycle 8	Dr. Keith MacGregor	AD/SMD	keith.b.macgregor@	202 358 2463
	Kepler Guest Observer - Cycle 6	Dr. Douglas Hudgins	AD/SMD	douglas.m.hudgins@	202 358 0988
D7	K2 Guest Observer - Cycle 3	Dr. Debra Wallace	AD/SMD	debra.j.wallace@	202 358 0917
D8	Strategic Astrophysics Technology				
	TDEM	Dr. Douglas Hudgins	AD/SMD	douglas.m.hudgins@	202 358 0988
	TPCOS	Dr. Rita Sambruna	AD/SMD	rita.m.sambruna@	202 358 2166
	TCOR	Dr. Mario Perez	AD/SMD	marioperez@	202 358 1535
D9	Nancy Grace Roman Technology Fellowships	Dr. Billie Lightsey	AD/SMD	billy.lightsey@	202 306 1896
D10	NuSTAR Guest Observer - Cycle 2	Dr. Louis Kaluzienski	AD/SMD	louis.j.kaluzienski@	202 358 0365

TDEM	Technology Development for Exoplanet Missions
TPCOS	Technology Development for the Physics of Cosmos Program
TCOR	Technology Development for the Cosmic Origins Program

2014 SMD ROSES NRA
Appendix E - Cross Division

		POC	Org	Email	Tel
E1	Cross Division Research Overview				
E2	Topical Workshops, Symposia and Conferences	Dr. Max Bernstein	SMD	max.bernstein@	202 358 0879
E3	Exoplanets Research Programs	Dr. Christina Richey	PSD/SMD	christina.r.richey@	202 358 2206

NASA Science Mission Directorate (SMD)
Stand Alone Mission of Opportunity Notice (SALMON-2)

What:
The Stand Alone Mission of Opportunity Notice (SALMON) AO invites proposals for Missions of Opportunity (MO). A MO is a focused space flight investigation that offers high scientific or technical value for a modest cost to NASA. There are five categories of MO:

- Partner Missions of Opportunity (PMOs) provide a critical component of a non-NASA or non-US mission – such as a complete science instrument, hardware or software components, technology demonstrations, or research experiments
- U.S. Participating Investigators (USPIs) are complete science investigations that are realized through the participation of U.S. investigators on non-NASA missions and do not involve the development of hardware or software components or complete instruments or subsystems.
- New Science Missions using Existing Spacecraft are investigations that propose a scientific new use of existing NASA spacecraft.
- Small Complete Missions (SCMs) are scientifically or technically valuable investigations that can be realized within the specified cost cap, including the cost of their access to space if not provided by NASA
- Focused Missions of Opportunity (FMOs) address a specific, NASA-identified flight

Proposals will be assessed against announcement criteria by panels of individuals who are peers of the proposers in the relevant scientific and technical areas.

Traditionally, Missions of Opportunity have been solicited in conjunction with SMD AOs for PI-led missions (e.g., Discovery, Explorer, Earth System Science Pathfinder (ESSP), Mars Scout, New Frontiers). The SALMON AO incorporates Program Element Appendices (PEAs) for general MO proposal opportunities, as well as for focused proposal opportunities for specific flight opportunities.

How Much / When: Varies by PEA/MO

Where: NNH12ZDA006O
http://soma.larc.nasa.gov/salmon-2/index.html

NASA Aeronautics Research Mission Directorate

http://www.aeronautics.nasa.gov/

NASA can best contribute to the nation's future societal and economic vitality by focusing aeronautics research in six thrust areas that are responsive to a growing demand for mobility, challenges to the sustainability of energy and the environment, and technology advances in information, communications and automation.

The six areas are:

1. Assured autonomy for aviation transformation
2. Innovation in commercial supersonic aircraft
3. Ultra-efficient commercial vehicles
4. Transition to low-carbon propulsion
5. Real-time system safety assurance
6. Safe, efficient growth in global operations

To most effectively manage the research needed to address these six areas, NASA's Aeronautics Research Mission Directorate has restructured itself. Three mission programs –

- the Airspace Operations and Safety Program
- the Advanced Air Vehicles Program
- the Integrated Aviation Systems Program

will address the first goal: to clearly define the most compelling technical challenges facing the aviation industry, and retire these challenges in a time frame that is supported by the stakeholders and required by NASA's customers.

NASA Aeronautics Research Mission Directorate

http://www.aeronautics.nasa.gov/

Advanced Air Vehicles Program (AAVP)
Innovative design concepts developed by AAVP for advanced vehicles integrate multiple, simultaneous vehicle performance considerations that focus on fuel burn, noise, emissions and intrinsic safety. The goal: to enable new aircraft to fly safer, faster, cleaner, quieter, and use fuel far more efficiently. The projects include: Aeronautics Evaluation and Test Capabilities; Advanced Air Transport Technology; Advanced Composites; Commercial Supersonic Technology; and Revolutionary Vertical Lift Technology.

Aerospace Operations and Safety Program (AOSP)
The goal of AOSP-developed NextGen methods and means is to provide advanced levels of automated support to air navigation service providers and aircraft operators for reduced air travel times and air travel-related delays, and to insure greater safety in all weather conditions. The projects include: Airspace Technology Demonstrations; Shadow Mode Assessment Using Realistic Technologies for the National Airspace System; and Safe Autonomous systems Operations

Integrated Aviation Systems Program (IASP)
Conduct flight oriented, integrated, system-level research and technology development that supports the flight research needs across the ARMD strategic thrusts, the programs and their projects. The projects include: Environmentally Responsible Aviation; Unmanned Aircraft System Integration in the National Airspace System; and Flight Demonstrations and Capabilities

Transformative Aeronautics Concepts Program (TACP)
The Transformative Aeronautics Concepts Program (TACP) cultivates multi-disciplinary, revolutionary concepts to enable aviation transformation. The projects include: Convergent Aeronautics Solutions, Transformational Tools and Technologies; and Leading Edge Aero Research for NASA

NASA Aeronautics Research Mission Directorate (ARMD)

Research Opportunities in Aeronautics (ROA)

What: ARMD conducts high-quality, cutting-edge research:

- Foundational research across a breadth of core aeronautics competencies that supports aeronautics and space exploration activities;
- Key areas related to the development of advanced aircraft technologies and systems, including those related to aircraft safety, environmental compatibility, and fuel efficiency
- Research that supports the Next Generation Air Transportation System (NextGen) in partnership with the Joint Planning and Development Office
- New topics added as "Appendices to the ROA" Research Announcement as the year progresses
- Standard period of performance is three years.
- Evaluation by peers of the proposing personnel is used to assess proposals

How Much: Funding levels vary with the different topics

When: Varying dates - notice of Intent (NOI) and proposal due dates are provided in the ROA announcement or subsequent amendments

Where: (NRA): NNH15ZEA001N

http://www.aeronautics.nasa.gov/index.htm

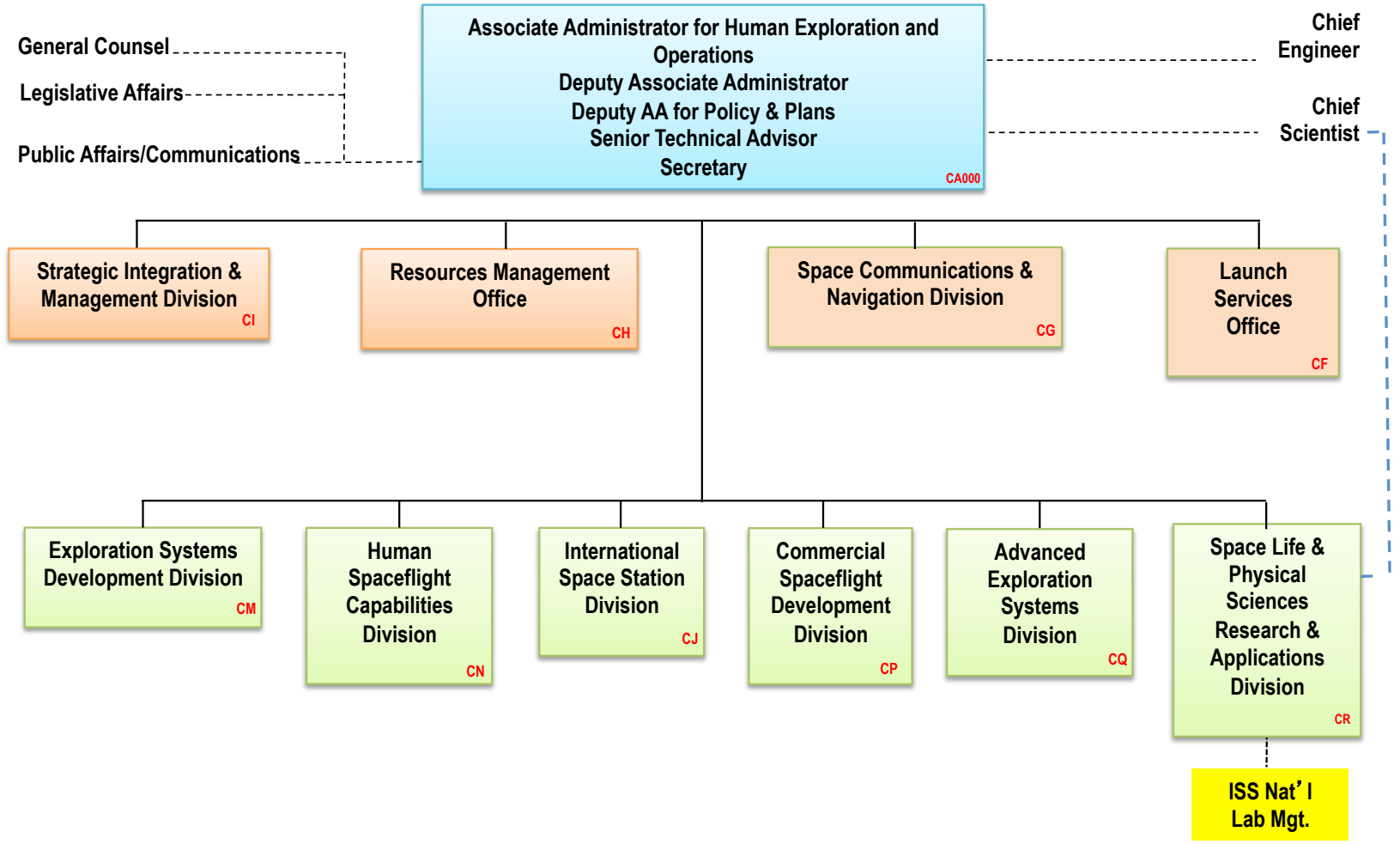
http://nspires.nasaprs.com/external/

2015 NASA ARMD NRA
Appendices (Topics) A through D

Append	Program	Principal	Org	Email	Tel
A-1	Advanced Air Vehicles Overview				
A-2	Advanced Air Transport Technology (AATT)				
A-3	Revolutionary Vertical Lift Technology (RVLT)				
A-4	Commercial Supersonic Technology (CST)				
A-5	Advanced Composites (AC)	Robert A Martin		Robert.A.Martin@nasa.gov	
A-6	Aeronautics Evaluation and Test Capabilities				
B-1	Airspace Oerations and Safety Program Overview				
B-2	Airspace Technology Demonstration Project				
B-3	Shadow-mode Assessment Using Realistic Technologies for the National Airspace System				
B-4	Safe Autnomous Systems Operations Project				
C-1	Integrated Aviation Systems Program				
C-2	Environmentally Responsible Aviation (ERA) Project				
C-3	Unmanned Aircraft Systems Intregration in the National Airspace System				
C-4	Flight Dmonstrations and Capabilities Project				
D-1	Transformative Aeronautics Concepts Program Overview				
D-2	Leading Edge Aeronautics Research for NASA Project				
D-3	Transformational Tools and Technologies (TTT) Project				
D-4	Convergent Aeronautics Solutions (CAS) Project				

Human Exploration and Operations Mission Directorate Organizational Structure

http://www.nasa.gov/directorates/heo/home/about.html#.VRsJ7WZ53Zc



NASA Human Exploration and Operations Mission Directorate (HEO)

Human Exploration Research Opportunities (HERO)

What: The goal of the HRP is to provide human health and performance countermeasures, knowledge, technologies, and tools to enable safe, reliable, and productive human space exploration. The scope of this goal includes both the successful completion of exploration missions and the preservation of astronaut health over the life of the astronaut. Specific objectives in support of this goal are:

1. Quantification of the crew health and performance risks associated with human spaceflight for the various exploration missions.
2. Development of countermeasures to provide mission planners and system developers with strategies for mitigating crew health and performance risks.
3. Development of technologies to provide mission planners and system developers with strategies for monitoring and mitigating crew health and performance risks.

Specific opportunities/due dates are published as Appendices:

Appendix A: NASA Research and Technology Development to Support Crew Health and Performance in Space Exploration Missions

Appendix B: NSBRI Research and Technology Development to Support Crew Health and Performance in Space Exploration Missions

Appendix C: NASA Human Research Program Omnibus Opportunity

Appendix D: NASA Ground-Based Studies in Space Radiobiology

How Much: Range from $100 - $450K/yr for one to five years

When: varies by appendix, parent solicitation open until 4 Sept 2015

Where: NRA: NNJ14ZSA001N
http://www.nsbri.org/FUNDING-OPPORTUNITIES/Current-Announcements/

HERO Appendices General Topics

Appendix A: NASA Research and Technology Development to Support Crew Health and Performance in Space Exploration Missions - proposals are solicited in the areas of:

Physiological Stress and Clinical Incidence Onboard the International Space Station,
Vertebral Strength Analysis in Astronauts after Long Duration Spaceflight: Analysis/Evaluation of Existing Data,
Tissue Sharing Opportunities from a 90-Day Hind-Limb Rat Suspension Study,
Identification and Maintenance of Team Shared Mental Models over Long Durations,
Effective Team Composition for Long Duration Space Exploration,
Lighting Protocols for Exploration – HERA Campaign,
Automated Tools for Scheduling Behavioral Countermeasures for Exploration - HERA Campaign,
Investigate Effects of Acute CO_2 Exposure with Existing Measures,
Asynchronous Behavioral Health Treatment Techniques,
Innovative Research in Behavioral Health and Performance for the Human Exploration Research Analog (HERA),
Host-Microbe Virulence Mechanisms,
Electronic Procedures for Autonomous Crews, and
Generalizable Skills and Knowledge for Exploration Missions.

Unless otherwise noted, these projects are expected to be multiple year efforts.

Appendix B: NSBRI Research and Technology Development to Support Crew Health and Performance in Space Exploration Missions - proposals are solicited in the areas of:

Cardiovascular Alterations,
Human Factors and Performance,
Musculoskeletal Alterations,
Neurobehavioral and Psychosocial Factors,
Sensorimotor Adaptation, and
Smart Medical Systems and Technology.

These projects are expected to be multiple year efforts.

NASA Space Biology Research
NRA NNH14ZTT001N

What:
Hypothesis-driven Space Biology (SB) research proposals to conduct Space Flight Experiments on the International Space Station (ISS) in the research areas:

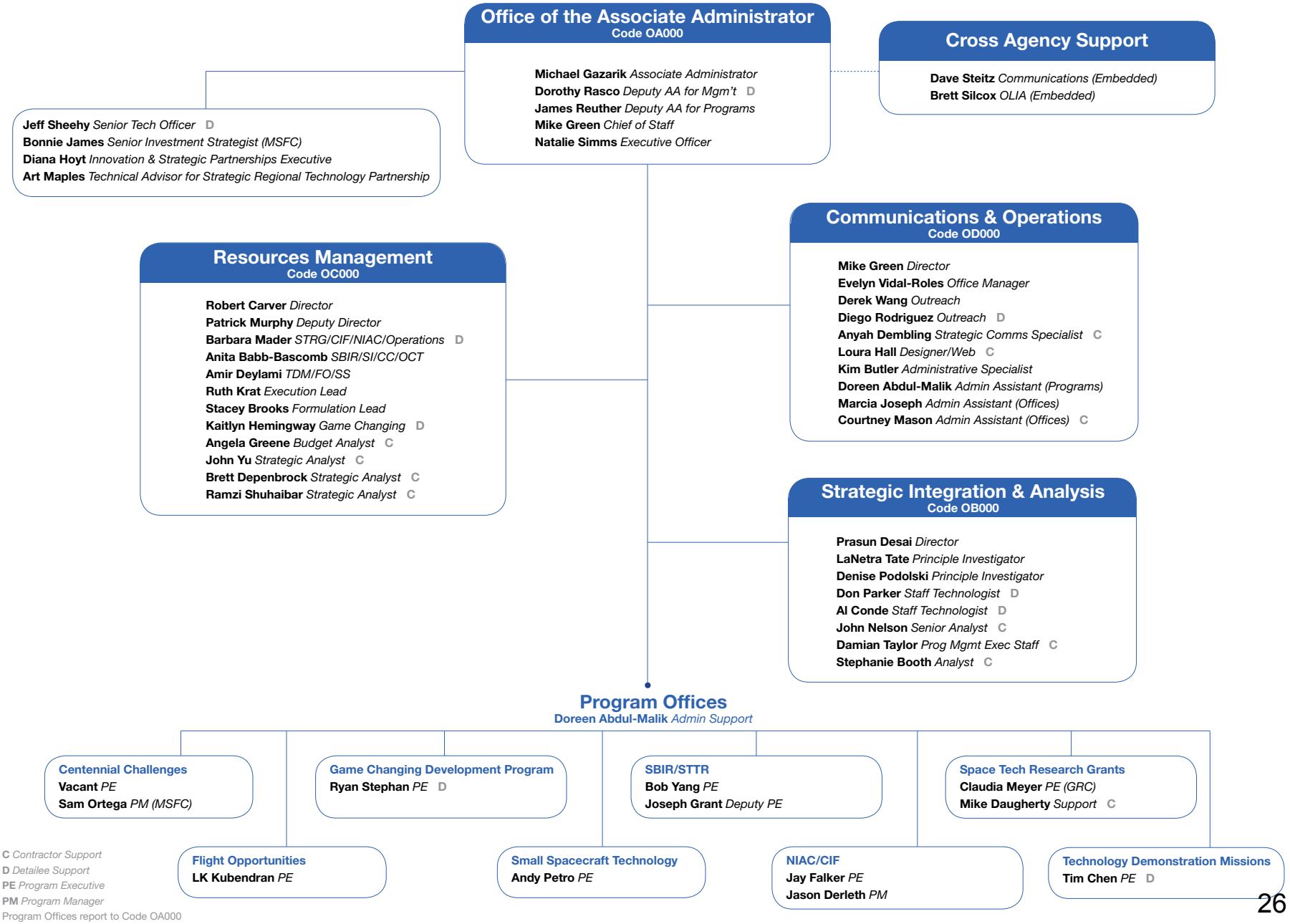
- Mechanisms of Mammalian Adaptation to Long-term Spaceflight and Readaptation on Return to Earth
- Mammalian Cell, Tissue and Organ Generation and Degeneration in Space
- Multigenerational and Developmental Biology of Invertebrates
- Plant and microbial growth and Physiological Responses to the Multiple Stimuli Encountered in Space Flight Environments
- Experiments Demonstrating the Roles of Microbial-plant Systems in Long-term Life Support Systems
- Long-term, Multigenerational Studies of microbial Population Dynamics
- ISS Rodent Tissue Sharing
- Space Biology Investigations Using Nanoracks Cubelab ISS Flight Hardware

All ISS Space Flight Experiments will be awarded in two phases: a Flight Definition Phase first, followed by a Spaceflight Experiment Phase.

When: For 2014 Solicitation

Step-1 Proposals due 19 Dec 2013
Step-2 Proposals due 20 Mar 2014

STMD Org Chart



C *Contractor Support*
D *Detailee Support*
PE *Program Executive*
PM *Program Manager*
Program Offices report to Code OA000
October 2014

NASA

Space Technology Mission Directorate (STMD)

http://www.nasa.gov/directorates/spacetech/home/index.html#.VCwHFOdd-UM

The Space Technology program will advance multi-purpose technology, in some cases to flight-ready status. The Space Technology Program will complement the mission-focused technology development activities in NASA's Mission Directorates, delivering solutions to NASA's needs for new technologies in support of future NASA missions in science and exploration, as well as the needs of other government agencies and the Nation's space industry in a manner similar to the way National Advisory Committee for Aeronautics aided the early aeronautics industry. The Space Technology Program will enable new approaches to NASA's current mission set and allow NASA to pursue entirely new missions.

1. Innovative Advanced Concepts (NIAC) Program

NIAC focuses on early studies of visionary aerospace concepts. These will be architecture, mission, or system concepts and aiming ten or more years in the future.

2. Space Technology Research Grants Program

STRGP will accelerate the development of "push" technologies to support the future space science and exploration needs of NASA, other government agencies and the commercial space sector. Innovative efforts with high risk and high payoff will be encouraged.

3. Game Changing Development Program

This program focuses on maturing advanced space technologies that may lead to entirely new approaches for the Agency's future space missions and solutions to significant national needs.

4. Small Spacecraft Technology Program

This program will undertake both development of small spacecraft technologies and flight demonstrations of new technologies.

Space Technology Research, Development, Demonstration, and Infusion 2015 (SpaceTech-REDDI-2015)

What:
The following STMD programs are included in the solicitation:

- NASA Innovative Advanced Concepts (NIAC) Program focuses on visionary aeronautics and space system concepts. TRL Range: 1-3
- Space Technology Research Grants (STRG) Program engages academia in innovative research in advanced space technology TRL Range: 1-3
- Game Changing Development (GCD) Program focuses on maturing advanced space technologies that may lead to entirely new approaches for the Agency's future space missions. TRL Range: 3-5
- Small Spacecraft Technology (SST) Program develops and demonstrates subsystem technologies and new mission capabilities for small spacecraft. TRL Range: 3-7
- Technology Demonstration Missions (TDM) Program seeks to mature laboratory-proven technologies to flight-ready status. TRL Range: 5-7
- Flight Opportunities Program (FOP) facilitates low-cost access to suborbital environments for a broad range of innovators as a means of advancing space technology development and supporting the evolving entrepreneurial commercial space industry. TRL Range: 5-7

Proposals for technology research, development and demonstration in support of STMD will be solicited through Appendices under this umbrella solicitation as technology topics are defined and funding is made available for new opportunities. The Appendices will provide key information including: specific scope of the work solicited, anticipated budget for new awards, number of awards anticipated, notice of intent and proposal due dates, and specific instructions about proposal content and evaluation criteria.

How Much:

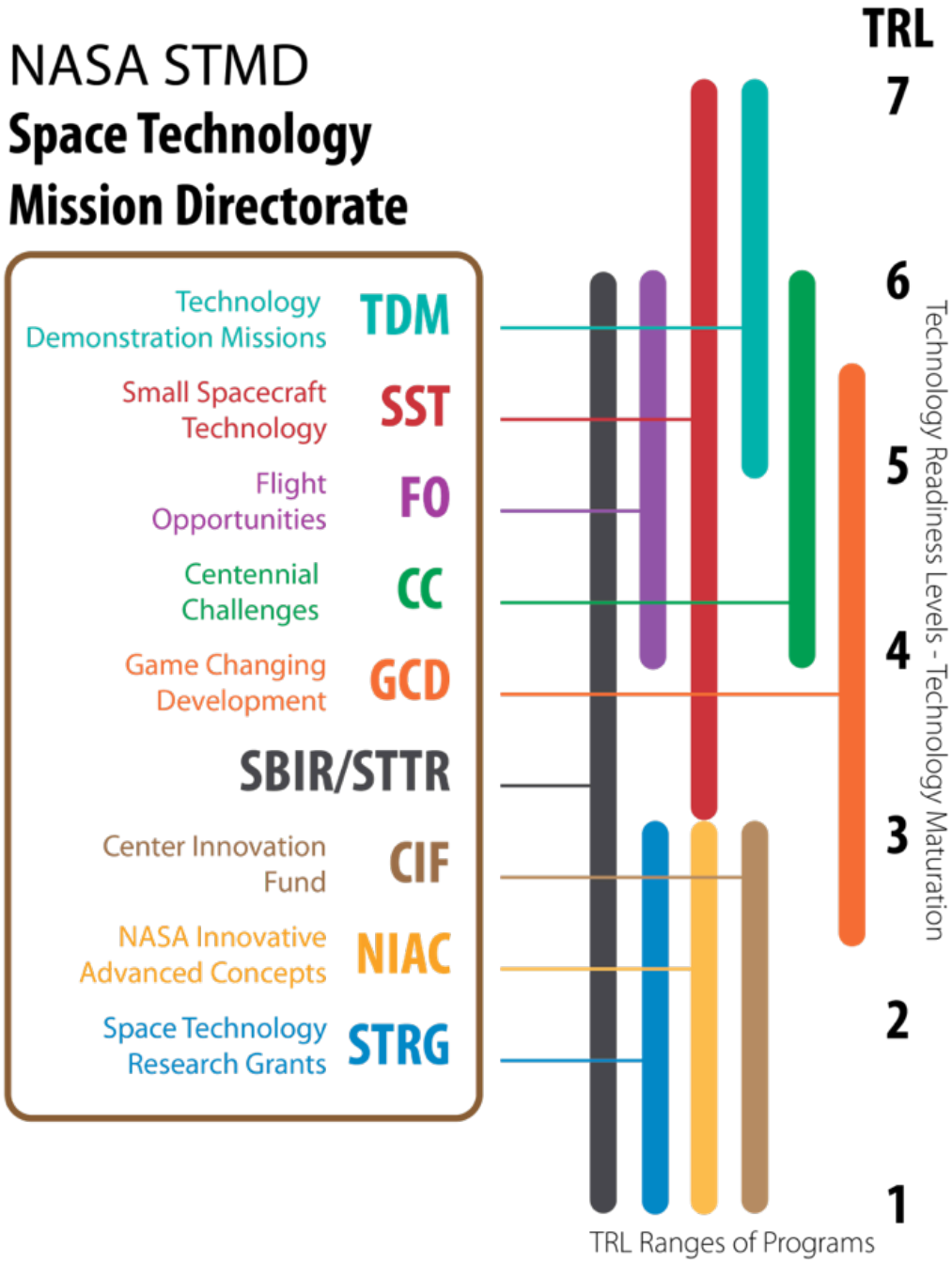
When: Estimated appendix released dates in next chart

Where: NRA NNH15ZOA001N

Estimated NNH15ZOA001N Appendices Release Dates

Program	Appendix	FY 2015 Targeted Release			
		Q1	Q2	Q3	Q4
NASA Innovative Advanced Concepts (NIAC)	A1 - NIAC Phase I	X (Oct)			
	A2 - NIAC Phase II			X (March)	
Space Technology Research Grants (STRG)	B1 - Early Career Faculty (ECF)		X		
	B2 - Early Stage Innovations (ESI)			X	
Game Changing Development (GCD)	C1 - GCD Technology Topics	X (Oct)			
	C2 - GCD Technology Topics	X (Nov)			
	C3 - GCD Technology Topics		X		
Technology Demonstration Missions (TDM)	D1 - Technology Demonstration Mission Topics				X
Small Spacecraft Technology (SST)	E1 - SST Development and Demonstration		X		
	E2 - SST Partnerships		X (Jan)		
Flight Opportunities Program (FOP)	F1 - FOP Technology Topic	X (Dec)		X	

Release of Appendices is subject to availability of appropriated funds and may change. Additional Appendices may be issued throughout the year as needed.



Additional information about STMD programs is available at http://www.nasa.gov/directorates/spacetech/home/index.html.

NASA STMD

Integrated Advanced Concepts Program (NIAC)

What: NIAC will support innovative research through two phases of study. The Phase I awards culminating from this call will be nine-month efforts to explore the overall feasibility and viability of visionary concepts. A follow-on Phase II proposal call will later be released to eligible recipients of Phase I awards, past and present, to further develop the most promising Phase I concepts for up to two years and to explore potential infusion options within NASA and beyond.

NIAC focuses on early studies of visionary aerospace concepts. These will be architecture, mission, or system concepts, typically Technology Readiness Level (TRL) 1-2 in maturity and aiming ten or more years in the future.
The proposed *concept* must satisfy all of the following attributes:

- An Aerospace Architecture, System, or Mission Concept
- Exciting
- Unexplored
- Credible

The NIAC call for proposals will be a two-step process. Phase I, Step A solicits a three page white paper and a separate one-page summary chart. These will be reviewed against the Phase I, Step A evaluation criteria in the NASA Research Announcement (NRA), and successful proposers will be invited to submit a full proposal in Phase I, Step B. These proposals will be given a full technical peer review according to the Step B evaluation criteria in the NRA.

When: White paper due 12 Nov 2014 for NIAC Phase I

How Much: typical award amount $500K

Where: NNH15ZUA001N-15NIAC-A1 (i.e., appendix 1)

Office of the Chief Technologist (OCT)

http://www.nasa.gov/offices/oct/home/index.html

NASA's Chief Technologist serves as the NASA Administrator's principal advisor and advocate on matters concerning agency-wide technology policy and programs. OCT is responsible for direct management of NASA's Space Technology programs and for coordination and tracking of all technology investments across the agency. OCT provides a technology and innovation focus for NASA through the following goals and responsibilities:

- Principal NASA advisor and advocate on matters concerning Agency-wide technology policy and programs.
- Up and out advocacy for NASA research and technology programs. Communication and integration with other Agency technology efforts
- Coordination of technology investments across the Agency, including the mission-focused investments made by the NASA mission directorates. Perform strategic technology integration.
- Change culture towards creativity and innovation at NASA Centers, particularly in regard to workforce development.
- Document/demonstrate/communicate societal impact of NASA technology investments.
- Lead technology transfer and commercialization opportunities across Agency.

NASA Centers

NASA Centers have opportunities for internships and fellowships, and occasionally to fund University programs.

Ames Research Center	http://www.nasa.gov/centers/ames/home/index.html
Dryden Flight Research Center	http://www.nasa.gov/centers/dryden/home/index.html
Glenn Research Center	http://www.nasa.gov/centers/glenn/home/index.html
Goddard Space Flight Center	http://www.nasa.gov/centers/goddard/home/index.html
Goddard Institute of Space Studies	http://www.giss.nasa.gov/
IV and V Facility	http://www.nasa.gov/centers/ivv/home/index.html
Jet Propulsion Laboratory	http://www.nasa.gov/centers/jpl/home/index.html
Johnson Space Center	http://www.nasa.gov/centers/johnson/home/index.html
Kennedy Space Center	http://www.nasa.gov/centers/kennedy/home/index.html
Langley Research Center	http://www.nasa.gov/centers/langley/home/index.html
Marshall Space Flight Center	http://www.nasa.gov/centers/marshall/home/index.html
Stennis Space Center	http://www.nasa.gov/centers/stennis/home/index.html

NASA
University Research Centers (URC) - Minority Institutions Only

The NASA University Research Centers, or URCs, project is designed to achieve a broad-based, competitive aerospace research capability among the Nation's Minority Institutions, or MIs, that will:

- Foster new aerospace science and technology concepts
- Expand the Nation's base for aerospace research and development
- Develop mechanisms for increased participation by faculty and students of MIs in mainstream research
- Increase the number of underrepresented and underserved students at Minority Serving Institutions who obtain advanced degrees in NASA-related fields

The specific objectives for URCs are to:

- Establish significant, multi-disciplinary scientific, engineering, and/or commercial research centers at the host university that contribute substantially to the programs of one or more of the four NASA Mission Directorates described in the NASA Strategic Plan
- Move increasingly towards gaining support from sources outside the URC project by aggressively pursuing additional funding opportunities offered by the NASA Mission Directorates, industry, and other funding agencies
- Improve the rates at which U.S. citizens, who historically have been underrepresented in NASA-related fields, are awarded undergraduate and graduate degrees at their respective universities in NASA-related fields

Awards are for five years, and do not exceed $1 million per year. Annually, twenty-five percent of the funding must be used as direct support to students.

The 13 active URCs were funded as Group 4 in 2008 and Group 5 in 2009.