Content

1. Why was the Origins of Solar Systems (OSS) ROSES element rebranded as the Exoplanet Research Program (XRP)?

2. How is the XRP responding to evolving needs in Exoplanet research?

3. Has there been a shift (and if so, by how much) in grants for exoplanet work compared to pre-exoplanet work (star formation, debris disk chemistry, etc)?
What is the Exoplanet Research Program (XRP)?

From ROSES-16 Element E.2

• The XRP element solicits basic research proposals to conduct scientific investigations related to the research and analysis of extrasolar planets

• Its broad objectives include the determination of compositions, dynamics, energetics, chemical behaviors of exoplanets, and the detection and characterization of other planetary systems

• The XRP program element is shared between the Planetary Science and Astrophysics Divisions

• The XRP fosters cross-divisional, multi-discipline science
Origins of Solar Systems (OSS) initiative started in 1986

http://ntrs.nasa.gov/search.jsp?R=19880021152

Started as an inter-disciplinary program for solar and space sciences; several years before the first exoplanet around solar-type stars were discovered

- Grain agglomeration
- Giant planet formation
- Terrestrial planet accumulation
- Gas-dust/planet-disk interactions
- Initial chemical and physical states
- Planetary atmospheres
Origins of Solar Systems (OSS) initiative started in 1986

After its inception, OSS continued to be an interdisciplinary solicitation jointly managed by the Planetary Science and Astrophysics Divisions, until ending as a program after ROSES-2013

http://ntrs.nasa.gov/search.jsp?R=19880021152
1. Why was the Origins of Solar Systems (OSS) ROSES element rebranded as the Exoplanet Research Program (XRP)?
• Encourage interdisciplinary research
• Enable PSD strategic decision making
• Be more flexible in responding to changing research priorities
• Reduce overlaps between program elements
• Make the structure of the R&A program explainable to those outside of NASA
• Make it easier for those outside of NASA to compute the amount of money spent on grants
Planetary Science Division Reorganization for ROSES 2014
Adapted from PSD document: http://www.lpi.usra.edu/PSD-RandA/PSD-RA-Mapping-Charge-v2.pdf

ROSES-13
- Origins of Solar Systems
- Cosmochemistry
- Planetary Geology and Geophysics
- Planetary Atmospheres
- Outer Planets Research
- Mars Fundamental Research
- Exobiology and Evolutionary Biology
- Planetary Observations
- Near-Earth Objects

ROSES-14
- Exoplanet Research Program
- Emerging Worlds
- Solar System Workings
- Habitable Worlds
- Exobiology
- Solar System Observations
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ROSES-13

Origins of Solar Systems
Cosmochemistry
Planetary Geology and Geophysics
Planetary Atmospheres
Lunar Adv. Sci. and Exp. Research
Outer Planets Research
Mars Fundamental Research
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ROSES-14

Exoplanet Research Program
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Planetary Science Division Reorganization for ROSES 2014

What did the Planetary Science Division OSS Proposals Become?

Where did the Planetary Science Division XRP Proposals Come From?

Adapted from PSD document: http://www.lpi.usra.edu/PSD-RandA/PSD-RA-Mapping-Charge-v2.pdf

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Planetary Atmospheres
Origins of the Solar Systems
2. How is the XRP responding to evolving needs in Exoplanet research?
Who Funds Exoplanet Research?

Space- and Ground-based investigations

NASA Planetary Science Division

NASA Astrophysics Division

Ground-based investigations

National Science Foundation

NASA Earth Science Division

NASA Heliophysics Division
In ROSES-16 the Astrophysics XRP does not fund...

- Archive data analysis
  - Go to ADAP
- Theoretical investigations or calculations
  - Go to ATP
- Lab Astro experiments
  - Go to APRA
- Technology development
  - Go to APRA
- Guest Observations
  - Go to the mission’s GO programs
- Simulations of space data
  - Go to the missions

In ROSES-16 the Astrophysics XRP does fund...

- Everything else (= Ground-based support of NASA’s Astrophysics Space Program)
What Investigations Do The Astrophysics Division Encourage Through The XRP?

- Follow-up observations of space-based planet detections
  - e.g. validation of Kepler, K2 and TESS planet candidates

- Ground-based observations that specifically increase the value of NASA space data
  - e.g. property characterization of new NASA planet detections

- Ground based observations that specifically increase the effectiveness or efficiency of future space observations
  - e.g. detection and/or characterization of future JWST targets

- Ground observations that inform operations of future space missions
  - e.g. collecting data that defines WFIRST visits to planetary systems
XRP and the Habitable Worlds Program

• Habitability has been an area of investigation for Kepler and K2 (+TESS)
• Biomarker science will become increasingly relevant to the Astrophysics Division as we progress from HST to JWST to WFIRST, and beyond
• Astrophysics R&A programs will need to support these activities in future years
• However, Habitable Worlds science is precluded from the XRP program in order to keep the Planetary Science Division R&A structure orderly
• The Planetary Division ROSES-15 Habitable Worlds element has become a cross-divisional element between Planetary and Astrophysics in ROSES-16
• New money is not available, but the Astrophysics Division will select suitably-strategic programs from Habitable Worlds for funding using XRP resources
3. Has there been a shift (and if so, by how much) in grants for exoplanet work compared to pre-exoplanet work (e.g. star formation, debris disk chemistry, etc)?
OSS/XRP Astrophysics Proposal Statistics

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### OSS/XRP Astrophysics + Planetary New Programs

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There is no long-term trend in the number or ratio of star and planetary-system formation programs in the OSS/XRP element.
Conclusions

1. Why was the Origins of Solar Systems (OSS) ROSES element rebranded as the Exoplanet Research Program (XRP)?
   - In response to a ROSES program shuffle by the Planetary Sciences Division

2. How is the XRP responding to evolving needs in Exoplanet research?
   - Requiring XRP programs to support NASA Astrophysics missions strategically to advance exoplanet science
   - Habitable Worlds programs can be supported through the XRP

3. Has there been a shift (and if so, by how much) in grants for exoplanet work compared to pre-exoplanet work (star formation, debris disk chemistry, etc)?
   - None within the OSS/XRP program