

Published on *American Geosciences Institute* (<https://www.americangeosciences.org>)

Home > House Committee on Science, Space, and Technology Subcommittee on Space and Subcommittee on Research Joint Hearing on Exoplanet Discoveries: Have We Found Other Earths?

---

## House Committee on Science, Space, and Technology Subcommittee on Space and Subcommittee on Research Joint Hearing on Exoplanet Discoveries: Have We Found Other Earths?

*Witnesses:*

**Laurance Doyle**

Principal Investigator, Center for the Study of Life in the Universe, SETI Institute

**John Grunsfeld**

Associate Administrator, Science Mission Directorate, NASA

**James Ulvestad**

Director, Division of Astronomical Sciences, National Science Foundation

*Committee Members Present*

Steven Palazzo (R-MS), Space Subcommittee Chairman

Donna Edwards (D-MD), Space Subcommittee Ranking Member

Larry Bucshon (R-IN), Research Subcommittee Chairman

Dan Lipinski (D-IL), Research Subcommittee Ranking Member

Lamar Smith (R-TX), Full Committee Chairman

Suzanne Bonamici (D-OR)

Dana Rohrabacher (R-CA)

Frederica Wilson (D-FL)

Marc Veasey (D-TX)

Ami Bera (D-CA)

On May 9, 2013, the House Committee on Science, Space, and Technology Subcommittees on Space and Research held a joint hearing to receive testimony on exoplanet research conducted by the National Aeronautics and Space Administration (NASA) and the National Science Foundation (NSF). Currently, 900 exoplanets, including three super-Earth sized planets located in the habitable zone, have been discovered. More than 2,700 planetary candidates exist as well. With planets around practically every star, research is now moving from simply identifying planets toward characterizing their properties, atmospheres, and formation, and searching for biomarkers. The fiscal year (FY) 2014 budget request for exoplanet research is \$55 million.

Future projects that will contribute to exoplanet research include the James Webb Space Telescope (JWST) scheduled to launch in 2018; the Transiting Exoplanet Survey Satellite (TESS), which will help scientists decide locations to target with JWST scheduled to launch in 2017; the Gemini Planet Imager (GPI) at the Gemini Observatory, which will examine up to 600 nearby stars; the Wide-Field Infrared Survey Telescope (WFIRST); and the Atacama Large Millimeter/submillimeter Array (ALMA) in Chile. Due to time constraints, opening statements were submitted for the written record and the hearing proceeded directly to witness testimonies.

In their written testimonies, Full Committee Chairman Lamar Smith (R-TX), Space Subcommittee Chairman Steven Palazzo (R-MS), Research Subcommittee Chairman Larry Bucshon (R-IN), and Research Subcommittee Ranking Member Dan Lipinski (D-IL) emphasized the important collaboration between NASA and NSF in collecting and disseminating data pertaining to exoplanet research. In particular, Smith highlighted how “cooperation between NASA’s space-based telescopes, like the Kepler mission, and ground-based telescopes funded in part by the [NSF] has enabled astronomers to expand their star gazing capabilities.”

Space Subcommittee Ranking Member Donna Edwards (D-MD) also praised the interagency collaboration in her written testimony, but raised concerns over “NSF’s ability to support a growing number of grant requests focused on exoplanet research...[with] relatively flat funding and the need to maintain currently operating facilities.”

Testimony from the witnesses focused on the history of exoplanet research, current methods of detection, and projections for future research. Laurence Doyle, Principal Investigator at the Center for the Study of Life in the Universe at the SETI Institute, and John Grunsfeld, Associate Administrator of NASA’s Science Mission Directorate, praised NASA’s Kepler mission for helping to advance exoplanet research. Grunsfeld stated that of the more than 900 exoplanets currently discovered, more than 122 owe their discovery to the Kepler mission. Grunsfeld attributed these discoveries to NASA’s collaboration with NSF, and the use of both space- and ground-based instruments. Doyle further emphasized the importance of the Kepler mission, saying that he considered Kepler-62f, a super-Earth-size planet discovered by the Kepler mission about 1,200 light-years away, to be the most Earth-like planet discovered so far. With continued research, Doyle stated that he believes scientists are “very likely [to] find a true Earth-sized planet within its star’s habitable zone” in the “next few years.”

James Ulvestad, Director of the Division of Astronomical Sciences at NSF, testified in his written remarks that the Arecibo Observatory, an NSF-funded project, discovered the first exoplanet in 1992. Ulvestad explained that NSF currently funds “40 active awards,” including many early career awards, in exoplanet research. He discussed the NSF’s role in providing ground-based instruments and the importance of international partnerships.

Palazzo opened the question and answer period inquiring as to how the development of the Space Launch System (SLS), an advanced heavy-lift launch vehicle, will assist in the detection of exoplanets in the future. Grunsfeld explained that the SLS allows NASA to lift heavier objects and transport them farther than current capabilities allow. This would make it possible for NASA to “scale up” their equipment and create an instrument or telescope “big enough to detect life” on a distant planet.

Edwards asked how budget cuts from sequestration would impact exoplanet research, and in-orbit upgrades to the JWST if cuts remain in place in fiscal year (FY) 2014. Grunsfeld replied that new projects in development will face the risk of greater impacts, such as launch delays, rather than observatories already in orbit, and that the JWST is “not serviceable” like Hubble because it must be located one million miles away in order to keep the infrared imaging technology cool. Ulvestad added that NSF’s individual grants may suffer and, if U.S. researchers cannot get access to the exoplanet research tools, the new research will be led by international partners instead.

Given the focus on finding water- or carbon-based life forms as signs of life in the Universe, Larry Bucshon (R-IN) asked if scientists have considered “other definitions of life” as well. Grunsfeld responded that the Mars Curiosity Rover is looking for “signs of previous carbon,” but with its array of instruments could also notice other signs of life. Doyle noted that some scientists are focusing on a definition of life that is simply “anything that can store information,” and that silicon-based life forms are not “out of the realm of consideration.”

Lipinski asked if there are ways to improve the collaboration between NSF and NASA. Grunsfeld and Ulvestad stated that NSF and NASA already collaborate well. They emphasized the importance of communication in making their collaboration effective and preventing them from implementing duplicative programs. Suzanne Bonamici (D-OR) opened a discussion regarding international collaboration on detecting exoplanets. Grunsfeld stated that “almost everything we do has large international collaboration” with “probably 90 percent” of the science missions involving international partners. Doyle stated that the Kepler mission has a “huge number of countries” involved with the research. Ulvestad noted that while there is significant collaboration, there is also competition and he hopes to see U.S. scientists leading the field of exoplanet research.

Bucshon asked for information on what to tell constituents when asked why funding for research, such as that into exoplanets, is “important to the American people.” Grunsfeld responded that “investment in basic research is an investment in the future.” He noted that research is “critical” for the nation’s “economic prosperity,” and has led to a plethora of “spinoff” technologies that benefit society every day. Investing in exoplanet, and similar, research inspires “kids looking up in the night sky” to pursue futures in STEM fields.

Opening statements, testimonies, and an archived webcast of the hearing can be found on the committee web site.