

## **DIVISION F** **COMMISSION 51**

## **BIOASTRONOMY** *BIOASTRONOMIE*

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## **REPORT**

### **1. Introduction**

The International Astronomical Union's Commission 51 was established in 1982 as "Bioastronomy: Search for Extraterrestrial Life". As the interests of Commission members expanded to include all aspects of the study of the origin, evolution, and distribution of life in the universe, C51 was renamed simply "Bioastronomy" in 2006. Thus, the term "bioastronomy" became for the Commission essentially synonymous with the NASA-coined term "astrobiology". Since the latter term has been adopted by many scientific societies around the world with similar interests, under the new Division and Commission structure of the IAU the Commission has been again renamed and is now Commission F-3 "Astrobiology".

The activities of the Commission encompass the search for extant life, evidence of past life, or evidence of prebiotic chemistry on solar system bodies, including Mars, Europa, Titan and Enceladus; the search for planets around other stars and potential spectroscopic evidence of habitability and biological activity; the origin of the biogenic chemical elements and the study of biologically relevant molecules in the interstellar medium and in primitive solar system objects such as comets, undifferentiated asteroids and some meteorites; the search for intelligent signals of extraterrestrial origin; the study of the origin, early evolution, and environmental constraints for life on Earth; the coordination of efforts in all these areas at the international level; and the establishment of collaborative programs with other international scientific societies with related interests.

### **2. Conferences**

This range of interests and activities have led the Commission to organize regular scientific conferences on an approximately three-year schedule:

- Origins 2014, July 6-11, 2014, Nara, Japan

- Origins 2011, Jul 3-8, 2011, Montpellier, France
- Bioastronomy 2007, Jul 16-20, 2007, San Juan, Puerto Rico
- Bioastronomy 2004, Jul 12-16, 2004, Reykjavik, Iceland
- Bioastronomy 2002, Jul 8-12, 2002, Great Barrier Reef, Australia
- Bioastronomy 1999, Aug 2-6, 1999, Big Island, Hawaii, USA
- Bioastronomy 1996, Jul 1-5, 1996, Capri, Italy
- Bioastronomy 1993, Aug 16-20, 1993, Santa Cruz, California
- Bioastronomy 1990, Jun 18-23, 1990, Val Cenis, France
- Bioastronomy 1987, Jun 22-27, 1987, Balaton, Hungary
- Bioastronomy 1984, Jun 18-21, 1984, Boston, Massachusetts, USA

In addition, the Commission has sponsored or co-sponsored multiple sessions at the triennial IAU General Assemblies, including Focus Meeting 15 on “Search for Water and Life’s Building Blocks in the Universe” at the IAU GA XXIX in Honolulu in 2015. The meeting was organized in 2.5 days with 5 sessions:

- Observation of water in the Universe
- Gas-phase organics molecules in the Universe
- Water in the Solar System
- Organics in the Solar System
- Delivery of water and organics to Earth

Proceedings are currently compiled.

Each triennial Commission conference has produced published proceedings:

- IAU Symposium 112 (1984, Boston, USA) :

The search for extraterrestrial life — recent developments : Proceedings of the 112th Symposium of the International Astronomical Union held at Boston University, Boston, Mass., USA. Dordrecht ; Boston : D. Reidel (1985)

- IAU Colloquium 99 (1987, Balatonfüred, Hungary):

Bioastronomy : the next steps : proceedings of the 99th Colloquium of the International Astronomical Union held in Balaton, Hungary, June 22-27, 1987, Ed. George Marx

- Third International Symposium on Bioastronomy (1990, Val Cenis, France):

Bioastronomy : the search for extraterrestrial life, the exploration broadens : proceedings of the Third International Symposium on Bioastronomy, held at Val Cenis, Savoie, France, 18-23 June 1990, Eds. J. Heidmann & M.J. Klein, Berlin ; New York : Springer-Verlag (1991)

• Progress in the Search for Extraterrestrial Life: Proceedings of the Bioastronomy Symposium (1993, Santa Cruz, California):

Ast. Soc. Pacific Conference Ser. 74, Ed. G.S. Shostak (1995)

• Astronomical and Biochemical Origins and the Search for Life in the Universe (1996, Capri, Italy):

Eds. C.S. Cosmovici, S. Bowyer & D. Werthimer Warsaw Technical University, ISBN 88-7794-092-1

• Bioastronomy '99 : a new era in bioastronomy (1999, Kohala Coast, Hawaii, USA): Ast. Soc. Pacific Conf. Ser. 213, Eds. G. A. Lemarchand & K. J. Meech (2000)

- IAU Symposium 213 (2002, Hamilton Island, Queensland, Australia):

Bioastronomy 2002 : life among the stars : Proceedings of the 213th symposium of the International Astronomical Union held at Hamilton Island, Great Barrier Reef, Australia,

8-12 July 2002, Eds. Ray P. Norris & Frank H. Stootman, San Francisco, Calif. : Published on behalf of the IAU by Astronomical Society of the Pacific (2004])

- Bioastronomy 2004: Habitable Worlds (2004, Reykjavik, Iceland):

Proceedings published in *Astrobiology*. June 2004, Vol. 4, No. 2: 232-308

- Bioastronomy 2007: Molecules, Microbes and Extraterrestrial Life , ASP Conf Ser. 420, 2009, Eds. Meech, K. J., Keane, J. V., Mumma, M. J., Siefert, J. L. & Werthimer, D. J.

- Origins 2011, joint meeting of IAU Commission 51 and ISSOL (Montpellier, France, 2011):

papers published in *Origins of Life and Evolution of Biospheres*, 41, issue 6, 2011

- Origins 2014, joint meeting of IAU Commission 51 and ISSOL (Nara, Japan, 2014): papers published in *Origins of Life and Evolution of Biospheres*, 45, issue 1, 2015

### 3. Future

Commission 51 met on August 5, 2015, in Honolulu. The meeting was chaired by Sun Kwok. The agenda for the meeting included: (i) the activities of 2012-2015 including the Origins 2014 Meeting; (ii) the GA Focus Meeting 2015; (iii) dates and locations of future meetings; and (iv) the transition to a new Commission "Astrobiology".

Due to the structure reform of the IAU, members of the Commission 51 applied for a new Commission with the name of "Astrobiology". This Commission was selected by the IAU Executive Committee as Commission F3 under Division F and will provide a new and broader platform for member of commission 51 and scientists that are interested in the interdisciplinary research topic of life in the universe.