

COMMISSION F2

EXOPLANETS AND THE SOLAR SYSTEM

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TRIENNIAL REPORT 2021–2024

1. Activities of IAU Commission F2 during 2021–2024

The Commission C.F2 “Exoplanets and the Solar System” resulted from the merging of the previous commissions C16 (*Physical study of planets and satellites*) and C53 (*Extrasolar planets*). Although extrasolar planets are detected and observed with different instruments and different techniques than the planets of the Solar System, the physical properties of these objects have many aspects in common. The Commission promotes exchange and interaction between the two communities.

In summary, the scientific activities and areas of expertise of the Commission members include:

- The search and characterization of exoplanets and their satellites,
- The investigation of Solar System planets and their satellites,
- The observations and modeling related to the origin of the planets and planetary systems,
- The modeling of planetary atmospheres, surfaces and interiors,
- The study of planetary dynamics,
- The laboratory work directly in support of such observational and theoretical investigations.

Commission F2 currently has 437 members.

Based on the positive evaluation of the Commission’s application for continuation by the IAU Executive Committee, Commission F2 Exoplanets and the Solar System will continue its effort during the upcoming term 2024-2027.

2. Activity

2.1. *Exoplanetary System Nomenclature*

Exoplanetary science is a relatively new field of study, with the first announced discoveries of bona fide exoplanets having occurred less than 35 years ago. As with much of astronomy, naming conventions have been developed ad hoc. Multiple star systems name individual members based on the name given when only one of the objects was known,

with Roman letters beginning with A and proceeding alphabetically in order of discovery or decreasing brightness; lower case letters, beginning with ‘b’ are used for companions to single-lined spectroscopic binaries. As most of the early exoplanet discoveries were made using stellar spectroscopy, this convention has been used for exoplanet designations. Thus, as with many classes of astronomical objects, exoplanet names are often arcane and non-descriptive.

Exoplanets have attracted considerable attention, and the public has wanted popular names for some of their favored planets. The IAU has responded with three public naming campaigns, the last of which occurred during this triennium. All three campaigns were well-received by the public, but the exoplanet scientists in general have not adopted public names in the research literature.

2.2. IAU symposia and focused discussions

The Organizing Committee of Commission C.F2 assessed proposals requesting the support of the C.F2 for IAU symposia and focused discussions. Most of the proposals submitted for the support have been considered to be of high quality and in agreement with the objectives of the commission, and therefore were endorsed. Some of the approved meetings have already taken place, with others scheduled to occur in the near future.

2.3. Consultation of the Commission Membership on Exoplanet Definition and Related Issues

The Organizing Committee of C.F2 decided to hold a plebiscite asking all commission members issue to vote on four issues related to the nomenclature, the definition of an exoplanet, and the credits of discoveries. The consultation questionnaire was sent to all members of the commission during the summer of 2018. The results of this wide consultation were presented at the General Assembly in Vienna and were reported in the 2018-2021 triennial report of Commission F2. A manuscript describing the history of planetary definitions and the rationale for the current definition, written by the Past President and current President of Commission F2 has been published in the current triennium. The reference for this manuscript is: Lecavelier des Etangs, A. and J. J. Lissauer, 2022. The IAU working definition of an exoplanet. *New Astronomy Reviews*, 94, 101641; arXiv.2203.09520.

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President of the Commission