

Submission regarding draft updated ANZSRC Fields of Research classifications

National Committee for Space and Radio Science

The National Committee for Space and Radio Science (NCSRS) welcomes the opportunity to comment on the draft of the updated ANZSRC Fields of Research. The NCSRS lodged a submission during the public consultation earlier this year pointing out that significant changes in space science and related areas were not represented in the current classifications, consequently hindering the assessment of proposals and reporting of research activity.

The NCSRS submission therefore recommended the separation of the current 4-digit FoR Group *Astronomical and Space Sciences* into two, 4-digit Groups: *Astronomical Sciences*; and *Space Sciences*, and provided suggestions of subdivisions within the new *Space Science* code. This proposal has been adopted by the ANZSRC Review Steering Committee.

The NCSRS **affirms and strongly endorses** the proposed new 4-digit classification *0210 Space science* in the draft updated ANZSRC Fields of Research. This change reflects the growth in scope and volume of space science research and related activities both nationally and internationally. For example, the joint Space Forum/Australian Space Research Conference held in Adelaide over September/October 2019 was attended by around 1,000 delegates from science, industry, government agencies, NGOs, and other areas. The International Astronautical Congress in held in Adelaide in September 2017 attracted 4,500 space science and industry delegates, while the 43rd COSPAR Scientific Assembly will be held in August 2020 and is expected to attract 2,000-3,000 space science delegates.

The ANZSRC Review Steering Committee proposed that the new classification *0210 Space science* include the following 6-digit fields:

- 0210 Space science
- 021001 Space instrumentation
- 021002 Mesospheric, ionospheric and magnetospheric physics
- 021003 Planetary science (excluding extraterrestrial geology)
- 021004 Space and solar physics
- 021005 Solar system energetic particles
- 021099 Space science not elsewhere classified.

The NCSRS **endorses** the inclusion of these fields in the new 4-digit classification. However, a number of important new and growing space science topic fields have not been included. These are listed below.

- **Astrodynamics and space situational awareness.** Space situational awareness involves the science of detecting, tracking and understanding the motion of space objects and debris. This is a major area of research nationally and internationally. Astrodynamics is the associated science of orbital mechanics, fundamental for space situational awareness and also for applications such as precise gravity determination and remote sensing. **These topics are not represented in any current FoR fields.**
- **Satellite and satellite-based positioning.** This encompasses all space-enabled position navigation and timing technology. It has dependencies on astrodynamics, space technology, and space weather (i.e. processes in the solar wind, magnetosphere and ionosphere). **These topics are not adequately represented in any current FoR fields, such as 0909 Geomatic Engineering.**

- Earth observation and remote sensing. These are major areas of research and activity and are not adequately represented in the current FoR classification.
- Space medicine and space life sciences. **These important topics are not represented in any current FoR fields.**

Recommendations

1. The updated ANZSRC Fields of Research classification is confirmed to include the proposed 4-digit code 0210 Space science and the proposed 6-digit fields identified in the draft classification.
2. A further 6-digit field, astrodynamics and space situational awareness, be included within the *0201 Space science* classification.
3. Further consideration take place when the draft classification is available for public comment on the inclusion of fields representing satellite and satellite-based positioning, Earth observation and remote sensing, and space medicine and space life sciences.
4. The typographical error in column E row 5 of the draft proposed 2-digit classification Physical Sciences be changed from '*Split into 020102 (Astronomical Instrumentation) and 020102 (Space Instrumentation)*' to '*Split into 020102 (Astronomical Instrumentation) and **021001** (Space Instrumentation)*.'