



## **Inter-commission WG C1-F2-F3-H2 Education and Training in Astrobiology Report 2018-2021 and Prospective 2021-2024**

**Chair** : Muriel Gargaud

**Members** : E.Bergin, H.Cottin, B.Garcia, W.Geppert, C.Impey, S.Kwok, C.Linneweaver, J.Martinez-Frias, T.Millar, M.Ohishi, F.Tian

This Working Group has been created in October 2015 and renewed in 2018 in order to coordinate training, education and outreach activities in astrobiology at the international level.

### [Report 2018-2021](#)

Five goals were identified in 2015, and continued over the period 2018-2021:

**1) To collect all lectures and conferences in astrobiology which have been recorded** during the last 10 years (whatever the language is), to categorize them according to their field and the public concerned (from general public to specialist of the field), and to make them available for free on a website so that people with few financial resources can access them remotely.

The platform « **Online courses in astrobiology** » launched in November 2017: <http://astrobiovideo.com/en/> have been enriched by 38 videos:

- Training School RED'18/Astrobiology Introductory course, Le Teich France, March 2018: 13 lectures
- Training School RED'19/Astrobiology Introductory course, Le Teich France, March 2019: 15 lectures
- Training School Basics in Astrobiology, IAU GA Vienna, August 2018: 10 lectures

**2) To produce handbooks and Massive Open Online Courses (MOOCs)** for university students - pooling the individual national efforts that are already in progress over the world

2 MOOCs have been produced during 2018-2021: <https://astrobiovideo.com/fr/search?t=mooc>

- Chris Impey : Introduction to Astrobiology, 6 modules of 6-7 lectures each (39 lectures)
- Alessandro Morbidelli/Sean Raymond: Modeling the origin of Jovian Planets (12 lectures)

Another one is in progress and should be available in 2021:

- Charley Linneweaver: “Are we alone in the Universe ? ”

The 3<sup>rd</sup> edition of the Encyclopedia of Astrobiology (<https://link.springer.com/referencework/10.1007/978-3-662-44185-5> , 45 thematic editors, 300 authors, 3000 entries) is in progress and should be achieved end of 2021

**3) To develop outreach for the general public and high school teachers.**

The book « **La plus grande histoire jamais contée** », Belin Publisher : <https://www.belin-editeur.com/la-plus-grande-histoire-jamais-contee> has been translated in Chinese and published by *Editions Bocaiyaji (Chine)*, 2019

The book “**Young Sun , Early Earth and the Origins of life**” published in English by Springer in 2012 has been updated/translated in Japanese and published by *Nishimura Edts (Japan), 2021*

**4) To create an annual international astrobiology training school (TS)** lasting 1-2 weeks, which would train the young generation in the basics of astrobiology.

The Training School « **Rencontres Exobio pour Doctorants/Astrobiology Introductory Course** » has been created in 2016 and take place every spring in France.

The program of the 2018 and 2019 editions can be found here:

<http://www.exobiologie.fr/red/index.php/fr/programme-red18/>,  
<http://www.exobiologie.fr/red/index.php/fr/programme-red19/>

50 students, essentially from Europe, have participated to each of these Training Schools. Unfortunately RED’20 has been cancelled because of the Covid pandemics

In addition to this annual TS, we have organized twice a 2-days TS before one international conference to let the local students (and also the conference PhD students) have a basics course in astrobiology :

- in Vienna in 2018 just before the IAU S345 symposium « Origins: from the protosun to the first steps of life »: <https://astronomy2018.univie.ac.at/symposia/symposium345/>
- in Hanoi in 2019, just before the conference « Search for life: from early Earth to exoplanets » <https://icisequynhon.com/conferences/2019/search-for-life/>

Lectures of all these TS (except Hanoi) are recorded and are available on the « Online courses in astrobiology »

**5) To organize a regular international workshop on education in astrobiology** in order to discuss how to carry out multidisciplinary training in astrobiology, how to evaluate students, how to train the trainers and above all to share all training materials that each country may have developed but kept in its national drawers,

The first *International Symposium on Education in Astronomy and Astrobiology (ISE2A)* has been co-organised in Utrecht in July 2017 in collaboration with the C.C1 Education commission : <https://ise2a.uu.nl/>. It gathered 200 participants. We thought to organize one in 2020, but its organisation has been postponed to the 2021-2024 period.

In collaboration with NASE (Network for Astronomy School Education, a WG of IAU-C1) the first *Astrobiology courses for High School Teachers* were developed , online and synchronous along 2020 in 4 continents , as part of the regular workshops of NASE (Workshop 10). The materials are available at the website of NASE [www.naseprogram.org](http://www.naseprogram.org)

#### Prospective 2021-2024:

**Chair** : Muriel Gargaud (France)

**Co-Chairs** : Beatriz Garcia (Argentina) and Christopher Impey (USA)

**Members** : E.Bergin, H.Cottin, W.Geppert, S.Kwok, C.Linneweaver, J.Martinez-Frias, M.Ohishi and others interested to join

For the period 2021-2024 we plan to go on with all these goals and in particular, we plan :

- **to develop further the platform « Online courses in astrobiology »** in
  - implementing MOOCs
  - adding lectures in languages other than English, French and Spanish.
  - developing short astrobiology lectures (10’) for the general public/young generation (16-20 years old ) and also for the youngest ones (2’ for the 10-16 years old) and in collaboration with the IAU Office of Astronomy for Education in Heidelberg, to implement subtitles in the language of all countries belonging to IAU.

- **to organize, as often as possible, a 2-days astrobiology TS** before each important international astrobiology conference, in addition to the « Rencontres Exobio pour Doctorants/Astrobiology Introductory Course » which is organised in France in English every year.  
If the sanitary situation allows it that could be the case in particular in
  - La Palma, Canarias Islands, 2022 (European Astrobiology Institute Conference)
  - Quito, Equador, 2022 (ISSOL Conference)
  - Johannesbourg, South Africa, 2022 (IAU Astrobiology Conference)
  - Quy Nonh, Vietnam, 2023 (Search for life: from early earth to exoplanets)
- **to develop outreach for the general public and high school teachers**  
In relation of what we have already done in the European COST Origins context: <http://life-origins.com/content/river-time-exhibition>, we plan to build a large Time Trek exhibition (13.8 Gy of the history of life emergence and evolution) which , as the short astrobiology lectures, could be adapted/translated to all the IAU countries language.
- **to train the trainers**, specifically in countries where astrobiology is not developed a lot.

**For these reasons, we ask the WG to be continued for the period 2021-2024.**