

## 2021 GEMINI TABLE OF THE AMATEUR PROFESSIONAL COLLABORATIONS

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**Abstract.** For this third workshop dedicated to Amateur Professional Collaborations organized in the "Journées de la SF2A", here is the update of the data base of the all the known topics with the latest information gathered in the GEMINI table. For this third workshop in the online organisation of "2021 Journées de la SF2A" this release allows authors and participants to introduce the latest inputs related to the topics they are involved in or even create new lines. This is an important action in the frame of the GEMINI partnership between SAF and SF2A.

Keywords: citizen science, amateur-professional, pro-am collaborations, astronomy

### 1 Introduction

Thanks to the two very successful workshops hold during the "Journées de la SF2A" 2018 in Bordeaux (Midavaine 2018), then 2019 in Nice (Midavaine & Herpin 2019a), SF2A and SAF decided to organize this third workshop in the frame of their partnership. The 2021 online organisation of this workshop allows a wide participation both for authors and attendance. This annual meeting gives the opportunity to share on a poster this table gathering all the Amateur Professional Collaboration topics and to update it with the latest data to release here in the proceedings the version AA of the table.

### 2 The Amateur-Professional Collaboration Topics Table

0 years ago I consolidated a data base in an Excel file gathering the panorama of astronomical topics for amateurs willing to do science. It was first published on the Club Eclipse web site \* then in "l'Astronomie" (Collectif 2009) and in 2019 during the IAU meeting (Midavaine & Herpin 2019b). This 2021 version AA of the data base classifies amateur activities breakdown in five headlines:

- Object discovery : the most fascinating task for amateurs is the ability to discover new objects,
- Object surveillance: one amateur strength, thanks to the observer numbers spread over all the Longitudes and the quotidian weather diversity range,
- Observation campaign : mobilization of observers on astronomical events for data acquisition,
- Data gathering : Thanks to methodologies, digital imaging and processing, amateurs can provide reliable metrological data in five scales :
  - Astrometry
  - Photometry
  - Polarimetry (useful for few topics)
  - Spectroscopy
  - Time and datation

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\*Club Eclipse web site [http://astrosurf.com/club\\_eclipse](http://astrosurf.com/club_eclipse)

- Exploitation of data base : this is a growing up field, thanks to dedicated web site gathering the overwhelming data collected by robotic instruments or space probes

Through the lines in column A, you have a review of all the potential topics from the closest like shooting stars, up to the farthest related to quasars or even cosmology! The columns are organized according to the above activity breakdown. It covers all the topics spread over a large range of required skillness from the beginners to start to do science up to the amateur experts, including the thema for amateur professional collaborations from data acquisition, up to scientific publishing. Here are some comments on the column contents:

Column B gives the minimum magnitude to reach to be able to perform the respective object discovery. You may notice this magnitude start from 6 with Nova discovery easily done every year with Digital Single Lens Reflex (DSLR) Camera with standard high aperture lens.

Column C gives the Surveillance program name or reference.

Column D gives the event for dedicated campaign to acquire data.

Column E : does the topic requires metrology ? These metrologies are quoted in the five following columns with the minimum useful accuracy required from the instrument, of course an improved one could be wished.

Column F: the waited accuracy in arc second for Astrometry.

Column G: the relative accuracy for Photometry.

Column H : the useful accuracy of Polarimetric ratio.

Column I : the waited Spectral resolution.

Column J: the Time accuracy (datation and sampling) in second for the above measurements or surveillance and event detection.

Column K you have the on line data base reference where amateur or citizen contribution is waited.

Column L : you have the "Castor" the name of the amateur focal point in France or abroad.

Column M: you have the "Pollux" the name of the professional focal point in France or abroad.

Column N : the name of an organisation or Society coordinating the topic.

Column O : the web site dedicated to the topic.

Column P : an e-mail address, this is often the e-mail address of the focal point or of the organisation.

And in column Q : the name of the conference gathering the actors on the field.

This table could be used in several ways. One of the purposes is to allow amateur astronomers, amateur observatories, amateur societies and scholarship projects to choose a topic and to define the fitted instrument setup. I quote in several colors the table cells to allow a quick access to any project :

Blue : the easiest topics for the beginner with small instrument,

then in Green : topics relying on a dedicated process methodology, a 200mm maximum telescope aperture is enough,

then in Orange : topics requiring large telescope 500mm aperture class with sensitive and accurate instruments to analyze and record signals and accurate amateur skillness. This is where Amateur Observatories and Amateur Mission Telescopes like T60 <sup>†</sup>, Astroqueyras <sup>‡</sup> or TJMS <sup>§</sup> are meaningful referent organisation for these projects,

then in Purple : very challenging topics requiring heavy hardware with involvement of thousands of hours which is achievable for amateur dedicated instruments.

Therefore all the known amateur professional collaborations are quoted in this table. Some are old topics waiting to be awake. Some topics meet strong interest without professional involvement for it's historical perspective or pedagogic purpose. Another way to use this table is to take empty cells to wonder whether it could become a new active topic. Thanks to the papers and lectures from the communities, given all along the years, the file is updated at least once a year. Here is the version AA of the table released in 2021, this up date includes the latest data introduced during this workshop. Feel free to contact us for proposing new inputs for the 2022 update. Today it is in French, dedicated to the francophone community; an English worldwide version could be prepared through multi-country partnerships and with IAU as it was proposed in Bruxelles during the Amateur day of the 100th year IAU Symposium (Midavaine & Herpin 2019b).

<sup>†</sup>Association T60 Observatoire Midi Pyrénée web site <http://www.astrosurf.com/t60/>

<sup>‡</sup>Astroqueyras web site <https://www.astroqueyras.com/>

<sup>§</sup>TJMS web site <https://www.planete-sciences.org/astro/Le-Telescope-Jean-Marc-Salomon>

### 3 Conclusions

The SAF SF2A partnership is now running with the delivery of several productions meeting the amateur professional collaboration needs with

- This table update
- The organisation of the annual GEMINI Prize awarding the best Amateur Professional Collaboration through a call for candidates. The third GEMINI Prize will be launch beginning of 2022
- The GEMINI collaboration web portal <sup>¶</sup>
- Prepare the proposal of a fourth Amateur Professional Workshop during the next Journées de la SF2A scheduled in June 2022 in Besançon.
- Prepare a third Photometry School

### References

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<sup>¶</sup>Gemini web site <https://proam-gemini>

