

COMMISSION H3

PLANETARY NEBULAE

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TRIENNIAL REPORT 2015-2018

1. Introduction

Commission H3 Planetary Nebulae (PNe) has been approved as a regular IAU Commission under IAU Division H in August 2015, with a proposal from active IAU Members in the PN community. Previously, the IAU PN Working Group (WG) was the focus group of the PN researchers within the IAU. The IAU PN WG has been active from 1967 to 2015. Letizia Stanghellini (US) is the H3 Commissions founder President. The current OC consists of Albert Zijlstra (UK) as VP, Arturo Manchado (Spain) as Secretary, and Karen Kwitter (US), Miriam Pena (Mexico), and Orsola De Marco (Australia) as OC members. The Commission at large currently has 78 IAU members.

The main goals of the IAU PN Commission H3 are (i) ensuring that scientific symposia on PNe take place regularly, ideally every 5 years (these symposia would preferably be sponsored by the IAU); (ii) organizing and coordinating meetings on the subject of PNe at the IAU General Assemblies (Joint Sessions, later Focus Group Meetings); and (3) maintaining a web page with general information about the WG, activities related to PN sciences, and future meetings and symposia.

The Commission had been very active on its first triennium. In the following, we describe the completed milestones.

2. IAU Symposium 323 - Planetary Nebulae: Multi-wavelength probes of stellar and galactic evolution (10-14 October 2016, Beijing, China)

The planetary nebula (PN) community has a long history of wide breath IAU Symposia, which recur every 4-6 years, as for a to discuss the developments of the PN field in the current and future instrumentation and modeling scenario. These Symposia are convened also to involve the younger members of the community and give them a chance to be involved in collaborations. The IAU Symposium 323, whose SOC was lead by Xiaowei Liu (China), Letizia Stanghellini, and Amanda Karakas (Australia), had been excellent at serving its purpose, which includes a sense of history and continuity for the

PN community, and its exposure to related fields. The Symposium had many scientific and organizational highlights, in particular, we were privileged to have the IAU President, Silvia Torres-Peimbert, to give the introductory talk on history and scope of this Symposium. Also, the venue of the conference seemed to be ideally suited for long discussions and calm viewing of the posters. We had two major discussion sessions on “Data and modeling” and on “Future instrumentations” related to the field of PNe. The invited panelists for the sessions did a good job of involving the audience, and we had polite but animated discussions to last all and maybe outlast the allotted time. The LOC did a great job in supporting these discussions, and in all other aspects of the conference. To involve the young Symposium participants, especially students, we also issued a prize for the best science posters at the conference. This initiative seems to be warmly received and helped to create a climate of enthusiasm and accomplishment amongst students. The Symposium webpage can be found at <http://iaus323.pku.edu.cn/iaus323/>.

3. Focus meeting 4: Planetary nebulae as probes of galactic structure and evolution (5-6 August 2015, at the XXIX IAU General Assembly, Honolulu, US)

The FM4 was chaired by Letizia Stanghellini, Roberto Mendez, and Miriam Pena, and was focused on extragalactic PNe and PNe as populations. The 2-day meeting included 11 invited talks, and the remaining time was filled with exciting contributed talks and lively discussion. The meeting being within the IAU GA allowed many scientists from other fields to join the discussion, and this has been very fruitful also for the PN field experts and students.

4. Focus meeting 7: Radial metallicity gradients in star-forming galaxies (28-29 August 2018, at the XXX IAU General Assembly, Vienna, Austria)

While this is not a PN meeting, one of the SOC chairs (Letizia Stanghellini) and two SOC members (Karen Kwitter and Miriam Pena) are in the H3 OC, and some discussion for the need of this meeting was generated both in the FM4 at the previous IAU GA, and within the H3 OC. PNe will be included in the discussion of metallicity gradients for in the Milky Way and other galaxies. The webpage with all meeting information is at <http://www.arcetri.astro.it/fm7/>.

5. Commission H3 webpage

The Commission H3 webpage has been established and has been maintained by Letizia Stanghellini at NOAO with frequent updates including all membership, news, and meeting information, see <http://ast.noao.edu/staff/letizia/pn-commission/>.

6. Science highlights

A white paper on current PN science has been written following the initial discussion on the need for a PN IAU Commission. All members of the former IAU PN WG contributed to the white paper, which was curated by Karen Kwitter, Roberto Mendez, Miriam Pena, and Letizia Stanghellini. The abridged version of the scientific contributions has been published in *Rev. Mex. A&A* 50, 203, 2014.

7. Feedback from the community

During the IAU Symposium 323, the H3 OC polled the conference delegates to determine what they would wish to see in the next symposium (16 respondents). Shortly after the meeting, a similar survey was sent out electronically to the entire IAU membership of the commission (28 respondents). Based on this we determined that there is a need for further coordination with adjacent fields of research, such as AGB stars and a desire for larger collaborative consortia particularly to obtain observing time in premier facilities. Increased connection with laboratory astrophysics would also be beneficial. A way to attract researchers both to the field and to the commission should be devised such as increased web presence via social networks.

Letizia Stanghellini
President of the Commission