

COMMISSION 30

RADIAL VELOCITIES (RADIAL VELOCITIES)

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Goeff Marcy (USA),
Tomaz Zwitter (Slovenia),
Catherine Turon (France),
Robert Mathieu (USA)

PROCEEDINGS BUSINESS SESSIONS, August 14, 2009

1. Introduction

The meeting was unfortunately scheduled for the afternoon of the last day of the General Assembly, so attendance was low. Nevertheless, we had some good discussions.

As an introduction, the aims and objectives of the commission were recalled:

- to promote research in the radial velocities of celestial objects
- to disseminate knowledge of radial-velocity research within the astronomical community
- to promote and support international conferences relevant to the field of radial velocities
- to act as a clearing house for enquiries relating to research in radial velocities
- from time to time to propose resolutions that define the best practice of conducting radial-velocity research, or which define technical terms used in conducting this research
- advising the Executive Committee of the IAU on matters relating to radial-velocity research.

The different ways of achieving those goals (communications with members and the Division, triennial report, working group, conferences, election, newsletters, etc) were mentioned, and some comments were made on the corresponding activities of the commission during the last 3 year period.

2. Activities of the commission

2.1. *Members and Organizing Committee*

The first order of business was to accept and welcome the new members of the Organizing Committee, as well as the new president and vice-president. There was no need for an election because the number of nominees was the same as the number of vacant slots. The current composition is the following:

- President: Guillermo Torres (USA)
- Vice-President: Dimitri Pourbaix (Belgium)
- Organizing Committee members:
 - o Continuing till 2012: Robert Mathieu (USA), Geoff Marcy (USA), Catherine Turon (France), Tomaz Zwitter (Slovenia)

- Incoming (till 2015): Tsevi Mazeh (Israel), Dante Minniti (Chile), Claire Moutou (France), Francesco Pepe (Switzerland)
- Past President: Stephane Udry (Switzerland)

Several recently nominated new members of C30 were accepted as well, and welcomed into the Commission.

2.2. *Triennial report 2006-2009*

The report was prepared by the Vice President Willie Torres with the help of some members of the commission and the chairmen of the working groups associated with the commission. We can mention 3 important topics addressed in the report:

- Exoplanets: The field is driven by a significant push towards higher precision of relative radial velocities of stars allowing for the detection of smaller and smaller mass planets. The lightest one known has a minimum mass of only 1.9 Earth masses. The high-precision radial-velocity surveys are now revealing a large population of super-Earths and Neptune-mass planets. They also contribute to the detection of an increasing number of multi-planet systems. Searches for transiting planets are becoming more and more important, they have greatly improved their efficiency with new candidates being regularly announced. They require a substantial effort in radial-velocity observations to discard false-positive detections and determine the mass of the transiting object to be combined with the radius derived from the transit curve and eventually obtain the mean density of the planet.

- Velocities of stars in general: Large programs of radial velocity observations are leading to the release of several very large data sets (Geneva-Copenhagen survey, Sloan Digital Survey, RAVE, etc). Large surveys in preparation or complementary to future space missions are also still on going as e.g. radial-velocity measurements to define the SIM grid stars or to define a list of standards for GAIA. The period has also seen the characterization of binaries in clusters and galaxies.

- Asteroseismology: with the increase of the efficiency and precision of echelle spectrographs, asteroseismic observations of stars are developing giving access to the internal structure of stars.

2.3. *IAU political questions*

Future of Commission 30: Given that a good portion of the membership of Commission 30 (and also of the Organizing Committee) comes from the exoplanet field, which has been driving recent efforts to improve the radial-velocity precision, there was some discussion about the future of Commission 30 after the creation of Commission 53 (Extrasolar Planets). It was felt that there is still a significant purely stellar component in the Commission, and that perhaps it is time to change the title and character of Commission 30 to be more inclusive, e.g., including "Spectroscopy" in the name. It was also felt that we need to be more proactive in recruiting new members that are actively working in these fields (current membership stands at 138 individuals). It was given charge to the new Organizing Committee.

Report from division IX (Optical and Infrared Techniques): There will be some restructuring of the Division, which will move towards the creation of new working groups emphasizing new telescopes and instrumentation, as well as large sky surveys.

3. Reports from the different working groups

As part of the business meeting, we had the reports from the three Working Groups associated with Commission 30:

- Stellar Radial Velocity Bibliography (H. Levato): report on the status of the database.
- Catalogue of Orbital Elements of Spectroscopic Binary Systems (D. Pourbaix): report on the status of the database.
- Radial Velocity Standards (S. Udry): no progress on the list of standards (see hereafter). Presentation of the observational effort to define a list of standard for the GAIA mission (CU6).

Good progress continues to be made on the first two of these subjects with the involved groups regularly updating the corresponding databases. For the *Radial-velocity standards* working group, the situation is a bit less straightforward. Several large projects are measuring radial-velocities at different level of precision for their own needs (exoplanet search, support to space

missions, etc). The question was raised about the need for continuation of the effort to establish and maintain a list of radial-velocity standards, given the work that is already being done e.g. by various Doppler teams searching for exoplanets. Furthermore the list is continuously evolving as some of the stars are found to vary when observed over longer periods of time, or when measured at higher precision. The opinion was voiced that up-to-date lists of stars that have "constant" radial velocities down to a certain level can be obtained by contacting those teams directly. It may be that this is enough to satisfy the needs of the radial-velocity community. At this point, most of the participants were still in favor of an official list of standards. The question will however keep the interest of the commission during the next period.

S. Udry

President of the Commission