

Summary of EWASS S14 Symposium

Astroinformatics is a full fledged new discipline emerging from the need of extracting new knowledge from complex all-sky surveys and responding to the ever-increasing astronomical data-deluge. It is a multi-disciplinary science combining the fields of astronomy, computer science and advanced mathematics and statistics. It combines machine learning, modern database technologies, and complex data models to reveal correlation, cluster unlabeled data, identify outliers etc. and in general extend our knowledge about the universe in terms of classes of objects as well as individual objects.

A standalone series of Astroinformatics meetings has been held annually world-wide starting at Caltech in 2010. The latest one was in Sorrento in 2016, and the next one will be in Cape Town in Nov 2017. The dedicated session at EWASS 2017, held in Prague, was the first opportunity to present Astroinformatics to the wider astronomical audience who were not already sold on the concept.

The SOC had a difficult task of fitting 16 invited lectures, 16 contributed talks and 22 poster presentations in six 90-minutes blocks. Each poster was allotted a one-minute flash talk for an improved reach. The presenters were asked by SOC to prepare their talks for wide audience, without making them too technical. This effort was well received and rewarded by the attendance peaking at over hundred during morning invited lectures.

The energetic contributions in each session covered a vast landscape of Astroinformatics and related disciplines. On day one, the first block of the symposium was dedicated to the methods of combination large data sets. It started with two lectures about Virtual observatory, its infrastructure and technology as well as its practical impact on scientific analysis of vast amount of complex multi-spectral data resources. The second block was focused on classical machine learning, namely supervised methods used to identify and classify various known types of celestial objects using their morphology, shape of light curves or color indices. The third block was dedicated to modern deep learning and unsupervised methods with a particular focus on different flavors of artificial neural networks. The fourth block presented on the second day of the symposium was focused on challenges of Big Data problems (e.g. how to make spatial queries in a table with trillion rows of objects coordinates or to the exciting plans for LSST data processing). The fifth, more philosophically oriented block was concentrated on the process of knowledge discovery in big data sets and on the advanced statistical analysis. Finally, the last block of the S14 symposium introduced different projects in astroinformatics and various software tools.

The second day of the EWASS symposium was organized in collaboration with the COST Action TD1403 BIG-SKY-EARTH. The action is mandated to identify common problems in handling PetaByte-scaled databases both in contemporary astronomy and Earth observation disciplines like remote sensing, climatology or seismology as well as discover in them the new scientific insights. Several EWASS symposium S14 participants continued the fruitful

discussion with their colleagues from non-astronomical disciplines during the COST meeting which started the next day after the EWASS. It was held at the Faculty of Information Technology of Czech Technical University in Prague with participation of more than forty scientists working on Big Data problems in Earth and Sky observations (including numerous students).

The presentations are available at the web of Czech EWASS organiser from Astronomical Institute of the Czech Academy of Science <http://space.asu.cas.cz/~ewass17-soc/Presentations/SY14.html> and will be soon available on Zenodo repository as an electronic proceedings.

The great interest shown in the symposium by the astronomy community at large has highlighted the importance of Astroinformatics - its application to all aspects of astronomy leading to enhanced understanding of the entire field is well appreciated.

Petr Skoda, chair of the S14 SOC and chair of LOC of COST Big Sky Earth meeting,
Emille Ishida, Rafael S. de Souza and Ashish Mahabal for S14 SOC.