“THE POLAR UPPER ATMOPSHERE: FROM SCIENCE TO OPERATIONAL ISSUES”, 17-21 September 2018, http://www.cifs-isss.org/pastcourses.asp

Brief report on the training course

The school offered specialist-training opportunities to students at undergraduate, graduate, PhD and Post-Doc level and early career scientists, by assembling a group of expert lecturers in geospace of Polar Regions. The focus was on the polar upper atmosphere within the solar-terrestrial interactions, and on multi-instrument monitoring and data to feed mitigation algorithms to improve GNSS services and products, which are strongly affected by the ionosphere. In addition, for the first time, the school trained students to prepare a research project proposal. The students joined an “inside team building” activity to familiarize them with the “first iteration of a project proposal”. The establishment of the student-teams through ad hoc socialization processes facilitated by two experts (M. Crescimbene and F. La Longa), aimed to stimulate the interaction among the new generation of scientists from different countries, and to stimulate their creativity. Two lectures focussed on the main aspects of preparing a project proposal (G. De Franceschi) and on successful projects highlighting the strengths to be taken into account (L. Alfonsi). The so established teams (four in total), met finally at the end of the first day of the school to appoint their own coordinator. To each team a “supervisor” was assigned who was an expert in the field of the upper atmosphere and Polar Regions (C. Cesaroni, L. Spogli, D. Di Mauro, M. Piersanti). The role of the team supervisors was to support the teams on the interpretation of the specific "call guide for applicants" as well to stimulate the students to define their roles and their duties in the proposal writing. The guide was simple, addressed to "bottom up" proposals in the field of the polar upper atmosphere, with few rules: proposal submission deadline, consortium members, the maximum budget allowed and eligible costs, length of the proposal, duration, gender balance, and risk assessment. A simple template was prepared and provided to the teams with main blocks to complete: excellence, impact, implementation, and budget.

The student teams worked diligently during the afternoon of each day of the school from Monday 17 to Thursday 20 September at 15.00 LT (proposal submission deadline). They were supported by the supervisors and by the team-building experts. Each student team presented their proposal on Friday 21 September with enthusiasm and quite effective slides. A Board (U. Villante, P. Cilliers, L. Alfonsi, M. Crescimbene, G. De Franceschi) was been established in order to evaluate the proposals with due consideration of several difficulties within the student teams (no experience, different educational background, the short time available, language difficulties, multi-ethnic groups, etc.). The relative weights of the criteria used in the evaluation of the project proposals were Excellence 25%, Impact 10 %, Implementation 20%, Documentation 15% and Presentation 30%. On the average, the Board found the proposals quite well balanced in the main sections (excellence, impact, implementation), which gave evidence that the student teams made a serious and well-formulated effort at their first iteration of a project proposal.

One of the proposals addressed to a possible service prototype for a massive consumer market on precise positioning. Another proposal focused on the extension of EGNOS toward the Arctic region by using "mobile GNSS" deployed on ships to overcome the lack of receivers at ground level in the Arctic. A third proposal indicated the use of a proxy index (Akasofu parameter) to determine the relation

between ionospheric irregularities and the direct injection of energy from the solar wind. The fourth proposal addressed the investigation and detection of ionospheric irregularities based on a multi instrument approach (VLF, Dynasonde, the AMPERE Iridium constellation facility, and Swarm satellites for in situ plasma density).

The "best" proposal was the one focusing on the Akasofu parameter, titled "SW-CUP (Solar Wind Coupled Upper Polar atmosphere)". The Board was unanimous in this selection and acknowledged the student team of the best proposal with award certificates (Figure 1). Finally, a few general recommendations for improvements were derived from the evaluation of the proposals and presented to the students. They include: the need to fill in all the sections of the template with relevant material, to pay attention to a realistic budget, to reduce the number of tasks and deliverables, to balance the budget and the personnel involved, and to set dissemination and communication targets which are clearly defined and strongly linked with the proposed impact of the project.

Figure 1-The UP – TEAM, winners of the project proposal competition (from right to left: Simone Di Matteo (Italy), Florine Enengl (Sweden), Ham Young-bae (South Korea), Sebastian Kaki (Finland), Daniele Biron (Italy)).