

Symposium Summary

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It has been a great pleasure for us to organize the 16th International Symposium on Nuclei in the Cosmos (NIC-XVI) in September 21-25, 2021, which is the first time for this important series of symposium to be held in China and in the form of on-line meeting. Total 388 participants including 170 research institutes and/or universities from 27 countries and regions joined together in this NIC-XVI. Owing to the strong support from participants all over the world, the symposium has been a success in the sense of providing a platform to summarize the exciting new advances of nuclear astrophysics and related fields. I feel highly honored to have hosted this symposium as the Chair of NIC-XVI.

NIC-XVI was co-hosted by China Institute of Atomic Energy (CIAE) and Institute of Modern Physics (IMP). The symposium is financially supported by the International Union of Pure and Applied Physics (IUPAP), National Natural Science Foundation of China (NSFC), Asia-Pacific Center for Theoretical Physics (APCTP), Asian Nuclear Physics Association (ANPhA), and other institutes and associations. Since the first NIC symposium in Austria in 1990, every two years we have such a meeting which combines many science fields of astronomy, astrophysics, cosmology, elementary particle physics, earth and planetary science, and meteorite science as well as nuclear physics. Past meetings had been held in Gran Sasso - Italy (2018), Niigata- Japan (2016), Debrecen-Hungary (2014), Cairns-Australia (2012), Heidelberg-Germany (2010), Mackinac Island-USA (2008), Geneva-Switzerland (2006), Vancouver-Canada (2004), Fuji Yoshida-Japan (2002), Aarhus-Denmark (2000), Volos-Greece (1998), Notre Dame-USA (1996), Gran Sasso-Italy (1994), Karlsruhe-Germany (1992), Baden bei Wien-Austria (1990).

The symposium topics include: Nuclear reaction rates and stellar abundances, The s process, Nuclear properties for astrophysics, High density matter, Novae and XRB, SNIa and the p process, Core collapse SN, mergers and the r process, Underground nuclear astrophysics, The early universe, Galaxy evolution, Radioactivity and meteorites, Inputs for Astrophysics. The whole scientific program consists of 23 invited talks, 62 oral talks, and 87 poster presentations of theory, experiment and observation. The selection of the fields and presenters reflected the recent advances, like interplay between mergers and r process.

New insights were added in this symposium owing to the exciting progress of gravitational wave and underground nuclear astrophysics. Substantial arguments were made on the cosmic, galactic, and stellar evolution based on foremost understanding of the origin and production mechanism of atomic nuclides under the free and generous atmosphere. A special emphasis was put in NIC-XIV on opening new scientific domains by cooperation and the synergy effect among researchers in interdisciplinary fields. In recent years, the observational and experimental efforts to detect the signals from celestial phenomena like supernovae or mergers of compact objects were highly rewarded for the development of new fields of astrophysics, i.e. neutrino astronomy and gravitational wave astronomy. Neutrino astronomy is based on technology of laboratory nuclear physics, and provides valuable knowledge in astronomy and astrophysics on how the atomic nuclides are created in stellar core collapse and explosions, which was one of the scientific highlights intensively discussed in NIC-XVI.

NIC school took place online from Sept. 13 to 20, 2021 with the help of JINA. The school covered a wide variety of topics such as gamma-ray astronomy, stellar grain, stellar modeling and nuclear experiments. By watching video lectures and discussing online with other participants and lecturers, about 20 students from 10 countries learned the basic knowledge and the most recent progress at the frontiers of nuclear astrophysics, were better prepared for the forthcoming NIC conferences. In the poster session, 5 students were awarded by ANPhA as the best posters based on the evaluation of senior researchers in the field.

Due to the COVID-19 pandemic situation globally, this symposium has to be made in hybrid mode. Except a few nearby Chinese participants who were able to attend the meeting in real location to ensure the atmosphere, whereas all foreign and most Chinese participants joined the symposium online. Special considerations were taken to make each presenter assigned a suitable time slot to present his/her talk. Thanks to the support and joining efforts of all participants, the symposium has been surprisingly smooth and did not encounter any interruption. This hybrid symposium with largest participants will give a unique memory in NIC history. I wish to take the chance to thank LoC members and young students very much for their skills and tireless efforts to make hardware and network working smoothly during the symposium.

Finally, I report that the NIC-XVI International Advisory Committee decided that the next NIC-XVII will be hosted by IBS in Korea in 2023. On behalf of NIC-XVI Organizing Committee, I hope that the 16th International Symposium on Nuclei in the Cosmos served

for all participants to exchange expertise and deeper knowledge on Nuclei in the Cosmos, and for the young generations in particular to raise international competitiveness and to get motivation on establishing new international collaborations and the leadership in the studies of nuclear astrophysics and related interdisciplinary science in the future.

Wish to meet you all in summer 2023 in Daejeon Korea!