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CSNS

Collaborative agreement between the Spallation Neutron Source Science Center and

Universidad de la República – Facultad de Química - Uruguay

Background

In response to government policies, the Ministry of Science and Technology of China has initiated the Belt and Road Joint Laboratory program, aiming to encourage domestic research institutions (Chinese) to establish cooperative relationships with countries along the Belt and Road.

The China Spallation Neutron Source (CSNS, China) is a large research platform for neutron scattering research and applications. It provides an advanced research platform for cutting-edge research in various fields such as materials science and technology, physics, chemistry, chemical engineering, resources and environment, new energy, life sciences, medicine, and nanoscience. It also addresses key issues related to many of the country's major strategic needs.

CSNS has 6 neutron instruments open to global users, including General-purpose powder diffractometer (GPPD), Multipurpose reflectometer (MR), Small Angle Neutron Scattering (SANS), Multi-Physics Instrument (MPI), Energy Resolved Neutron Imaging instrument (ERNI), Very Small Angle Neutron Scattering (VSANS). The other 5 instruments will be open soon. Moreover, we also have 11 instruments currently under construction in CSNS phase II project.

Muon spin rotation/relaxation (MuSR), as an important part of CSNS phase II project, is also under construction. This will play a significant role in the fields of condensed matter physics, magnetic materials, new energy materials, superconducting materials, and more.

The back-angle white neutron source (back-n) at CSNS stands as a premier white neutron source on the global stage, outfitted with a variety of high-performance spectrometers tailored for diverse reaction cross-section measurements. This facility can meet the urgent needs for neutron nuclear data measurement research in various scientific and applied fields.

The Associated Proton Experimental Platform (APEP) utilizes proton beams stripped from residual gases on the CSNS negative hydrogen linear accelerator to conduct

experiments and tests related to proton irradiation applications. Leveraging the advantages of the CSNS facility, nearly 5000 hours of beam time can be provided annually. This proton beam experimental platform enables research on the irradiation effects of electronic devices and integrated circuits, irradiation damage effects and modifications of semiconductor materials, irradiation damage of structural materials, proton activation analysis, calibration of proton detectors, as well as studies on biological irradiation effects.

Based on the previous friendly and pleasant cooperation with **the researchers in Universidad de la República – Facultad de Química - Uruguay**, the China Spallation Neutron Source plans to collaborate with **Universidad de la República – Facultad de Química - Uruguay** in applying for the Belt and Road Joint Laboratory. The research areas focus on Renewable Energy, Sustainable Environment. Based this joint laboratory, the CSNS can provide neutron beam time to **the researchers in the Universidad de la República – Facultad de Química - Uruguay , supporting them to develop novel materials for advanced energy storage/conversion technologies**. The joint laboratory will provide a convenient channel for personnel exchanges between both parties, promoting cooperation and exchanges in the field of energy and other areas. Moreover, the establishment of this laboratory is in response to the Chinese government's Belt and Road Initiative, effectively enhancing the international reputation of both parties, promoting diplomatic relations between the two countries.

Based on the Joint Laboratory:

The Parties shall contribute to the joint activities by making Experts and Students available to each other, including participation in reviews, experiments, joint studies and trainings. This includes recommending candidates to apply for financial support from funding agencies to support the joint activities

(1) CSNS can provide the free beam time for the researchers in Universidad de la República – Facultad de Química - Uruguay the beam time include neutron beam time, MuSR beam time, back-n beam time and APEP beam time.

(2) Collaborate on the development of new materials based on renewable energy sources, and share technology exchanges.

(3) Both parties collaborate in student training and academic exchanges, such as jointly organize academic conferences, neutron schools, and more.

This Agreement establishes the basic terms of collaboration and is subject to the provisions of the regulations in force for each institution. Activities involving joint developments or technological exchange shall be subject to specific agreements signed by the legal representatives of the parties, which shall regulate, among other aspects, confidential information and possible intellectual property rights.

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In the case of the Universidad de la República – Facultad de Química, specific activities involving the contribution of financial resources shall require a favorable budget availability report.

Dr. Alvaro Mombrú Rodriguez

Rector Interino

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Dr. Shen Wang

Spallation Neutron Source Science Center