

Opportunità di collaborazione Italia-Cina

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Canali ufficiali di cooperazione nel settore della fusione termonucleare: EUROFusion eccetera

EAST, HL-3, CFEDR, **BEST**, KTX, etc...

MAECI: Programma Esecutivo di cooperazione bilaterale Italia-Cina: un nuovo bando ogni tre anni

Center for Nonlinear Plasma Science

Collaborazione con la University of Science and Technology of China: una proposta da parte dei colleghi cinesi.



**Burning plasma
Experimental
Superconducting
Tokamak**

BEST Research Plan

*‘From vision to action:
BEST missions and
pathways to realisation’*

**ASIPP and EUROfusion
1st Edition
November 2025**

BEST Research Plan, 1st Edition: Missions and Pathways to Realisation

Foreword

This first edition of the BEST Research Plan has been jointly prepared by a dedicated team of ASIPP and EUROfusion researchers, with valuable contributions from UKAEA experts. The work commenced on 26 November 2024 at the 1st Joint BEST Research Plan Meeting at the CRAFT campus in Hefei. The aim of the Research Plan is to establish the foundational framework and facilitate active collaboration among Chinese, European, and other international partners for the development, operation and full exploitation of BEST.

As a living document, the Research Plan will continue to evolve, incorporating additional topics and detailed studies in future editions. We hope that this effort will strengthen the culture of international collaboration on the path towards realizing magnetic confinement fusion as a sustainable energy source. We anticipate that this collaboration will advance toward the joint utilization of this cutting-edge D-T tokamak, playing a critical role in supporting future ITER operations and significantly contributing to the design, development and licensing of CFETR and next-generation fusion power plants.



Group photo from the 1st Joint BEST Research Plan Meeting held on 26-29 November 2024 in Hefei, China, marking the official commencement of this collaborative activity.



ITALY - the Italian Ministry of Foreign Affairs and International Cooperation
P.R. China - National Natural Science Foundation of China (NSFC)
SCIENCE AND TECHNOLOGY COOPERATION
CALL FOR JOINT RESEARCH PROPOSALS FOR THE YEARS 2026-2028

CLOSING DATE: December, 6 2025
in Italy at: 12 p.m. CEST – in P.R. China at: 16 p.m. CST

BACKGROUND

Within the framework of the Memorandum of Understanding signed in Beijing on November 17, 2015 between the Ministry of Foreign Affairs and International Cooperation of the Republic of Italy and the National Natural Science Foundation of China, the Directorate General for Cultural and Economic Promotion and Innovation, Office IX of the Italian Ministry of Foreign Affairs and International Cooperation (MAECI) and the Bureau of International Cooperation of the National Natural Science Foundation of China (NSFC), hereinafter referred to as the “Parties”, **are opening a call for Joint Research Projects in the field of natural sciences for the years 2026-2028**. Proposals shall concern activities that exhibit strong bilateral impact by either strengthening existing or creating new links targeting relevant scientific objectives.

1. GENERAL INFORMATION

1.1 FUNDING SCHEMES

With regard to the present call, the funding scheme available is “*Joint Research Projects*”. This funding scheme aims at supporting joint research activities of collaborating Italian and Chinese research groups. Inclusion of early career scientists in the research teams will be positively evaluated. The expenses for research activities are co-funded by both Parties.

1.2 ELIGIBILITY REQUIREMENTS

Project proposals:

- must be written in English;
- the project title must be identical in the application to both Parties;
- must have the same duration of the Executive Programme (EP): three (3) years, 2026-2028;
- each Principal Investigator (PI) must submit only one proposal.

Italian Party:

- the call is open to public or private (no-profit) research institutions;
- the Italian PI must have Italian or any other EU nationality, legal residence in Italy, and must be affiliated with a public or private (no-profit) Italian research institution with a permanent or temporary (staff-equivalent) position.

Chinese Party:

- applicant’s support organization must have registered at the NSFC;
- the total number of the programs a researcher with senior rank (title) applies for (either as applicant or PI) and undertakes (either as applicant or PI) shall not exceed two;
- applicants shall only apply for one type of programs once in a year;

- invalid application code;
- no signature on the additional document, i.e., the collaborative agreement;
- for other eligibility rules, please refer to the call for proposal on NSFC’s website.

1.3 REASONS FOR EXCLUSION

- Lack of any one of the eligibility requirements listed above;
- incomplete application, according to criteria specified in the call text (including additional documents where applicable - see point 3 below);
- proposals submitted in different priority research areas by the collaborating PIs in the two countries;
- proposals eligible in only one of the two countries.

2. PRIORITY RESEARCH AREAS

Proposals must be submitted in one of the following priority research areas:

- **Environment and Energy**
 - *Production, storage and transport of hydrogen; fuel cells; Energy with reference to renewable energies and advanced distributed generation*
- **Biodiversity**
 - Marine biodiversity
 - Use of advanced technologies for species and ecosystem monitoring and conservation
- **Agrifood**
 - *food quality and safety through innovative scientific models of evaluation and monitoring*
- **Health Science**
 - *Cancer Immunotherapy and Cancer Vaccines; Gene Therapy for Genetic and Rare Diseases*
- **Interdisciplinary projects to be performed on Large Italian and Chinese research infrastructures**
 - *including astronomy, physics, life science, polar and marine science*

Proposals submitted in other research areas will not be considered for evaluation. Not all of the above listed research areas may be funded, depending on the scientific quality of the submitted proposals. Research proposals involving technologies designed either for military, or for both civil and military applications (so called “dual use” technologies), will not be accepted under the present call due to their inherent risks and ethical implications.

3. SUBMISSION PROCEDURES

Joint proposals must be submitted by the Italian PI to the Italian Party and by the Chinese PI to the Chinese Party with identical English titles, must be written in English and have a duration of three (3) years.

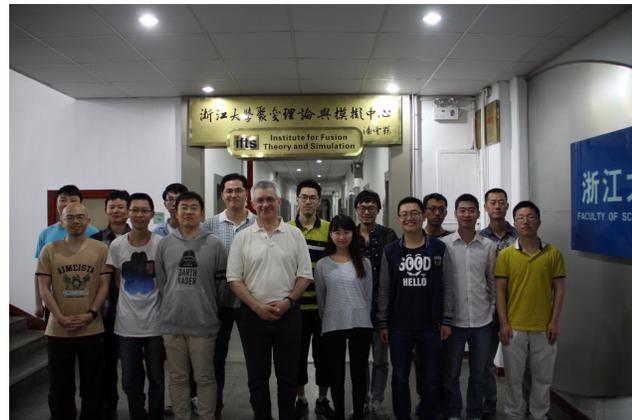
Italian Party

- Principal Investigators shall submit their project proposals exclusively online, by filling the dedicated forms at the following link: <https://pgr.esteri.it/>.
- For projects involving experiments with animals, the status of ethics approval by the competent Ethics Committee must be provided when submitting the proposal. A declaration of submission to the institutional OPBA (*Organismo Preposto al Benessere degli Animali*) in the project description from the PI is acceptable at the proposal submission stage. Please note that formal authorization by the competent Ministry of Health is mandatory to start the activities (D.Lgs 26_04/03/2014 and Directive 2010/63 EU). Projects involving experiments with human beings must be performed in accordance with the Directive 536/2014/EC. *The Italian Principal Investigator should include a self-declaration of adherence to the above cited rules in the Methods section of the proposal.*
- Applications for the Joint Research Projects funding scheme must be accompanied by an **endorsement**

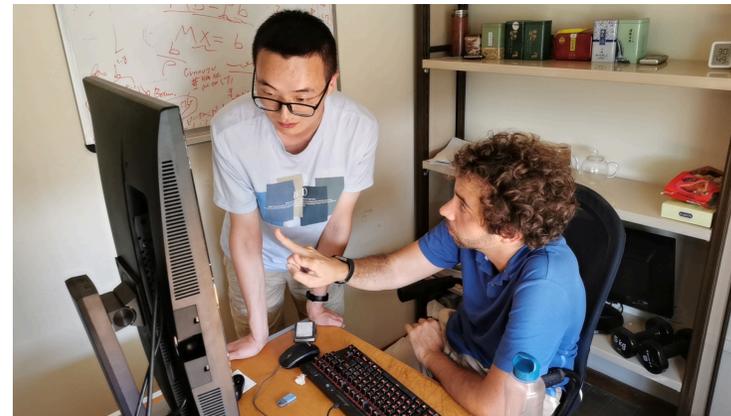
□ Center for Nonlinear Plasma Science (CNPS)

@ ENEA Frascati:

- <https://www.afs.enea.it/zonca/CNPS/>
- Established in 2020 as "Virtual Center" based on two hubs, one located at the ENEA Frascati Research Center and another at the University of Science and Technology of China, Hefei, to promote a joint research and collaboration network.
- Coordinator: F. Zonca, visiting Qiúshì Chair Professor, Institute for Fusion Theory and Simulation, School of Physics, Zhejiang Univ.



Teaching at ZJU (since 2009)



Mentoring at ENEA

- Recent extensions and new CNPS hubs
 - Southwestern Institute of Physics, Chengdu, China, 2022
 - CREATE Consortium, Naples, Italy, 2022
 - Korea Institute of Fusion Energy, Daejeon, August 2023

- Recent strengthening of CNPS collaboration at ASIPP:
 - Strong link with Key Laboratory of Frontier Physics in Contr. Nucl. Fusion (Zhiyong Qiu)
 - Strong collaboration with Theory Group on burning plasma physics (Youwen Sun)

- Focus of future collaboration:
 - Developing of predictive modeling of reactor relevant burning plasmas
 - Theory and simulation of EAST, BEST, DTT, CFEDR

Collaborative framework on T&S



- ❑ Memorandum of Understanding between CAS-ENEA:
 - Signed at highest level in Spring 2024

- ❑ Long lasting collaboration:
 - Participation into EAST, BEST and CFEDR IAC (F.Zonca)
 - Participation into BEST-EU joint team for preparation of BEST research plan (M. Falessi)

- ❑ Various activities under the framework of CNPS
 - Trilateral collaboration (China, Korea, Italy) on energetic particle physics (since 2013)
 - Project on “Turbulence and transport in burning plasmas” supported by MAECI and NSFC (2023-25; re-submitted)



A proposal from USTC to the Italian Plasma Physics Community

- **About USTC**

- The University of Science and Technology of China (USTC), located in Hefei (Anhui Province), is a prestigious research university under the direct guidance of the Chinese Academy of Sciences (CAS). Established to develop scientific and technological talent, it integrates the resources of the various CAS research institutes, with the goal of combining university education with cutting-edge research.
- It is a member of the C9 League (China's top 9 universities) and is recognized for its programs in physical sciences, chemistry, materials, and engineering. In summary, USTC represents excellence in higher education within the Chinese Academy of Sciences system. For this reason, it has been called the "cradle of scientific talent".

- **A new task for USTC**

- The Chinese government has entrusted the University of Science and Technology of China (USTC), and in particular the School of Nuclear Science and Technology at USTC, with the task of establishing a new model of excellence in the nuclear energy sector, consolidating the university's role as a strategic hub for education and research.
- The new academic approach is based on the integration between the Chinese Academy of Sciences (CAS) and the university, allowing students direct access to national laboratories and major scientific infrastructure.
- The training focuses on **plasma physics**, both fundamental and applied, and on the next-generation nuclear science and technologies, with a particular focus on **controlled thermonuclear fusion** (through collaboration with the EAST and BEST projects in Hefei and other fusion experiments in China, see below), reactor safety, and advanced civil applications. The stated goal is to prepare highly qualified professionals capable of managing China's ambitious expansion into nuclear fusion.
- Central to this initiative is **international cooperation**: according to the Chinese government's directives, the new model of excellence must create a system open to the exchange of knowledge and experiences internationally for its students.

An invitation by
USTC:
Joint Italo-
Chinese Plasma
Physics
And Fusion Energy
Center.

- With specific reference to the last point, **USTC would like to invite the Italian Plasma Physics Community** to join efforts towards the establishment of a Joint Italo-Chinese Fusion Energy Center at USTC.
- The focus of the Joint Center will be the training of a new generation of fusion scientists, as well as cutting-edge research within an open international environment.

- **Mutual benefits of the Joint Center**

- USTC will make available adequate resources to support the joint supervision of a large number of PhD students and postdocs from Italy, China and other countries.
- Italian students and junior scientists will benefit from an environment at USTC where they will be able to carry out cutting-edge research in fusion energy, exploiting the strong ties between USTC and the Chinese plasma physics and fusion communities through its network of CAS institutes.
- CAS, particularly through the Institute of Plasma Physics (ASIPP) also located in Hefei, plays a central role in operating major research infrastructures like HL-3 and the EAST tokamak; furthermore, CAS is the driving force behind the BEST project (Burning Plasma Experimental Superconducting Tokamak, expected to start operation at the end of 2027) and manages BEST's entire technological roadmap.
- USTC also hosts a Reversed-Field-pinch experiment, KTX, and a group of scientists working on stellarator physics.
- Besides magnetic fusion, USTC scientists work on inertial fusion and more in general on aspects of fundamental plasma physics and its diverse applications, including beam-plasma interactions, space and astrophysical plasmas, and industrial plasma applications.
- Chinese students will be encouraged to join PhD programs in plasma physics and fusion energy at Italian research universities and institutions. Funding for Chinese students abroad will be made available by the Chinese CSC Scholarship program and by the International Cooperation Office at USTC.
- USTC will also provide funding for several Italian visiting professors and researchers willing to spend periods of at least three months/year in Hefei to boost the activities of the Joint Center.

Governance Model for the Joint Center

- It is recommended that the Joint Center will have two Directors, one from USTC and one from Italy.
- A **Scientific Board** will be established, composed in equal numbers by Chinese and Italian members belonging to Italian participating universities and research centers.
- **Italian hub at USTC:** USTC will host an Italian hub for the Joint Center, i.e., it will make available a fully equipped office and secretarial support for an Italian permanent presence at USTC, with a view to help with the organization of the Center's activities in China.
- **USTC hub in Italy:** Italy will host a USTC hub for the Joint Center, i.e., it will make available a fully equipped office and secretarial support for a USTC permanent presence in Italy, with a view to help with the organization of the Center's activities in Italy.

Activities

- The Scientific Board of the Joint Center will recommend and organize the Joint Center's activities, having in mind the main goals of training a new generation of fusion scientists and of carrying out cutting-edge research in fusion energy.
- Some of the activities envisioned are:
 - (i) Organizing Joint Summer Schools in Italy and in China.
 - (ii) Organizing Conferences and Workshops.
 - (iii) Submit joint proposals for grants and joint participation in bilateral and international projects.
 - (iv) Joint supervision of PhD students.
 - (v) Students' exchanges at undergraduate and Master degree level.
 - (vi) Design and construction of university-scale, fusion relevant experiments.

Proposta per il CIP:

Creiamo un gruppo di lavoro per valutare la proposta della USTC e rispondere in modo coordinato.