

## 2018 HGF – GSI – OCPC – Programme

For the involvement of postdocs in bilateral collaboration projects

<b>Part A:</b>
<b>Title of the project:</b>
ALICE, the heavy-ion experiment at the LHC: analysis of Run 2 data and preparations for Run 3 with the upgraded detectors
<b>Helmholtz Centre and institute:</b>
GSI Helmholtz Center for Heavy Ion Research GmbH
<b>Project leader:</b>
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ALICE
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<b>Description of the project :</b>
<p>The ALICE group at GSI is strongly involved in the experiment activities with:</p> <ol style="list-style-type: none"> <li>1) The operation of central detector systems such as the Time Projection Chamber and the Transition Radiation Detector,</li> <li>2) Detector calibration and event reconstruction, and</li> <li>3) Several physics analyses of lead-lead, proton-lead and proton-proton collision data.</li> </ol> <p>The project proposed consists in data analysis in one the major areas of research of the group: investigation of charmonium and open-heavy-flavor hadron production; study of particle flow and correlations; determination of the properties of (anti-)(hyper-)nuclei produced in hadronic collisions.</p> <p>The selected candidate will have the opportunity to analyse ALICE data from the LHC Run 2, join the various activities and responsibilities of the group in the Collaboration (software</p>

developments, shifts, etc.). In particular, a new data flow is being developed for the data, which ALICE will record from 2021 onwards, with continuous readout of its upgraded detectors. New online calibration and reconstruction algorithms are being developed, new data formats defined. The selected candidate will join these efforts. For this task, good expertise in programming, developing fast and efficient algorithms, applying multivariate analysis techniques and machine learning, is wished.

One of the above mentioned topics will be chosen at the time of the candidate selection and appointment. The candidate will conduct his research work in the ALICE group composed of nine staff scientists, two collaborating post-docs and eight doctoral students.

**Description of existing or sought Chinese collaboration partner institute:**

- Long standing collaboration with Prof. Nu Xu, PhD
  - Existing collaboration with Prof.Dr. Daicui Zhou, Dr. Paolo Bartalini and Dr. Yaxian Mao (ALICE group)
- Institute of Particle Physics  
Central China Normal University (CCNU)  
Key Lab. of Quark & Lepton Physics(CCNU), MoE  
Wuhan 430079 China

Further participation in ALICE and STAR experiments:

- China Institute of Atomic Energy, Beijing, China (Xiaomei Li)
- University of Science and Technology of China, Hefei (Zebo Tang, Yifei Zhang, etc)
- Shanghai Institute of Applied Physics (Song Zhang, Chen Zhong, Wei Li)

**Required qualification of the post-doc:**

- PhD in Physics
- Experience in experimental physics
- Experience with data analysis in the field of heavy-ion physics
- Additional skills in programming for data analysis, with focus on multivariate analysis techniques and machine learning
- Language requirement: English

### Part B:

#### Documents to be provided by the post-doc:

- Detailed description of the interest in joining the project (motivation letter)
- Curriculum vitae (CV)
- copies of degrees as a proof of education qualification
- List of publications (if any)
- 2 letters of recommendation

### Part C:

#### Additional requirements to be fulfilled by the post-doc:

- Very good command of the English language
- Strong ability to work independently and in a team