

Kraków, May 21, 2024

**Cyclotron Center Bronowice IFJ PAN Kraków**  
**Call for Proposals and Letters of Intent Deadline: July 8, 2024**

This is a call for letters of intent and proposals for experiments at the proton PROTEUS C- 235 cyclotron at CCB IFJ PAN, as well as request for reports on recently performed experiments. The CCB International Advisory Committee (IAC) meeting, during which the proposals and LoIs will be evaluated, is planned to be held in a hybrid mode (in-person and via zoom) on August 23, 2023.

At CCB, a proton beam with energies of 70-230 MeV and intensities up to a few nA is available for nuclear physics experiments. As the priority of the CCB is hadron therapy, depending on medical plans, the beam time for nuclear physics experiments will be organized in campaigns, mainly as night shifts or weekend shifts.

At present, two main detection systems are available:

1. LaBr3 and PARIS arrays coupled to the Kraków Triple Telescope Array (KRATTA) and DSSSD silicon detector:

- **LaBr3 array** – an array of 4 large volume LaBr3 detectors for detection of high-energy gamma-rays (up to 25 MeV);
- **PARIS array** – an array of 2-3 PARIS clusters (each possessing 9 LaBr3\_NaI phoswich detectors).
- **KRATTA** – a multi-modular array for charged-particle detection (which can be used in different configurations); it covers a broad energy range of protons that can be detected, from ~3 to 260 MeV, and provides mass resolution up to mass number  $A \sim 10$ ;
- **DSSSD** – Double-Sided Silicon Strip Detector: active area: 50mm x 50mm, no. of channels: 32 (16 per side), thickness: 1.5 microns, full depletion 200 V.

2. **BINA** - The Big Instrument for Nuclear Data Analysis – this detector is particularly suited to study the  $p+d$  breakup reaction. BINA is composed of two major parts: the forward wall, which measures the energy, the position, the polarization of proton and deuteron at scattering angles in the range  $10^\circ$ - $35^\circ$ , and the backward ball part, which covers the rest of the polar angle up to  $165^\circ$ .

In addition, there are possibilities to perform **detector's characterizations** with proton beam.

Proposals should be written using the **proposal form** available at the web page [https://experimentsccb.ifj.edu.pl/pdfs/Proposal\\_form\\_IFJ\\_PAN\\_CCB.docx](https://experimentsccb.ifj.edu.pl/pdfs/Proposal_form_IFJ_PAN_CCB.docx). It should contain the name of the spokesperson(s) and the name of the IFJ PAN Liaison, a list of participants (especially indicating the PhD students), an abstract, the basic physics goals of the experiment, a discussion of what exactly will be done in the measurement, and any relevant references. As there might be still an opportunity to partially support the experimental teams within the EURO-LABS EU project, please indicate the wish to use it.

Technical details of the proposed measurement and count-rate estimates should also be included. The proposals should be kept to a reasonable length, with a 5-page maximum. Please note that a liaison for the experiment from IFJ PAN, who shall also be a participant, has

to be indicated. Please inform about previous experiments performed at CCB, if relevant. Please also note that each publication with the results from CCB should include as co-authors the team from IFJ PAN that participated in the execution of the experiment.

The letters of intent are aimed at proposing new lines of research possibly based on new detection systems. They should also include description of physics goals of the proposed studies as well as technical details of detection setup and considerations regarding its mounting on the beam line. Please indicate also whether the proposal is part of a PhD thesis project.

You might be invited to present your report or proposal/Lol at the IAC meeting.

### **CCB International Advisory Committee**

Faiçal Azaiez (LNL Legnaro, Italy), Angela Bracco (University of Milano and INFN, Italy), Bogdan Fornal (IFJ PAN, Kraków, Poland), Zsolt Fülöp (ATOMKI, Debrecen, Hungary), Muhsin Harakeh (KVI-CART, Groningen, Netherlands) – CHAIR, Robert Janssens (University of North Carolina, Chapel Hill, USA), Stanisław Kistryn (Jagiellonian University, Kraków, Poland), Marek Lewitowicz (GANIL, Caen, France), Adam Maj (IFJ PAN, Kraków, Poland), Krzysztof Rusek (Warsaw University, Poland), Hideyuki Sakai (RIKEN, Japan), Christoph Scheidenberger (GSI, Germany).

Please feel free to contact:

- Maria Kmieciak ([maria.kmieciak@ifj.edu.pl](mailto:maria.kmieciak@ifj.edu.pl)) with questions concerning PARIS- LaBr3-KRATTA setup;
- Jerzy Łukasik ([jerzy.lukasik@ifj.edu.pl](mailto:jerzy.lukasik@ifj.edu.pl)) with specific questions concerning KRATTA;
- Adam Kozela ([adam.kozela@ifj.edu.pl](mailto:adam.kozela@ifj.edu.pl)) with questions concerning BINA;
- Michał Ciemala ([michal.ciemala@ifj.edu.pl](mailto:michal.ciemala@ifj.edu.pl)) with questions concerning detectors in-beam characterizations;
- Mirek Ziębliński ([miroslaw.zieblinski@ifj.edu.pl](mailto:miroslaw.zieblinski@ifj.edu.pl)) with all technical and infrastructure questions;
- Adam Maj ([adam.maj@ifj.edu.pl](mailto:adam.maj@ifj.edu.pl)) with questions that are of more general nature.

**IMPORTANT:** E-mail submissions should be sent to [adam.maj@ifj.edu.pl](mailto:adam.maj@ifj.edu.pl) **before midnight (CET) on July 8, 2024.**

More information at <http://experimentsscbb.ifj.edu.pl/>,

We are looking forward to interesting proposals for research at CCB IFJ PAN.

Sincerely,  
Adam Maj