Center for Theoretical Physics,
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Warsaw, **28.03.2025**

Competition for the Scholar-PhD Student position at the Center for Theoretical Physics, Polish Academy of Sciences

The **Director of the Center for Theoretical Physics PAS** announces a competition for the **Scholar-PhD Student** position at the **CTP PAS** within the research project **MAESTRO 15** „**Dynamics of processes around compact stars**" financed by the **National Science Center** (grant agreement no. **UMO-2023/50/A/ST9/00527**).

The aim of the project is to study theoretical models of gamma ray burst (GRB) engines. Using numerical computer simulations, a model of the magnetized ultrarelativistic jet driven by accretion onto a Kerr black hole, will be studied. It has been shown that the Poynting energy of such jets is transferred at large distances to a bulk kinetic energy, and ultimately radiated away in the form of gamma rays. The process of jet launching, its collimation and evolution, can be modeled numerically. The development of the dynamical models specifically addressed to short GRB engines (Janiuk, 2019) was motivated by discovery of the seminal source, with a gravitational wave counterpart, GW-GRB 170817. Later on, subsequently found several other sources that show associated kilonova emissions, have proven to be sites of r-process nucleosynthesis. The dense and hot ejecta where this r-process occurs, may help in jet collimation (Urrutia al. 2025). It is not clear though, whether the kilonova phenomenon must be uniquely related to short GRB-engines, or it is rather universal for both types of short and long GRBs. In the context of long bursts, related to colalpsing massive stars, the growth of black hole, change of its spin, and also related self-gravity force in the massive stellar envelope, may further complicate the picture (Janiuk, Shahamat & Król 2023) and influence the jet launching process.

The scope of work of the successful Candidates within the project will be on development of numerical simulations and analysis of observational data related to the jets and kilonovae, driven by the compact binary mergers and collapsing stellar cores.

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We expect the candidates to have:

- Master's degree in physics or astronomy,
- good theoretical and numerical background,
- interest in fluid dynamics and magnetohydrodynamics,
- independence and creativity in solving problems,
- knowledge of astronomical data reduction and analysis (gamma ray astronomy) will be a plus.

The application must include:

1. The scientific CV, including the progress in the university studies, scientific achievements (publications, participation in research projects and conferences), with the clause „***I agree to the processing of my personal data contained in the application documents for the purposes necessary for the implementation of the process recruitment by the doctoral school GeoPlanet***".
2. Cover letter.
3. A copy of the Master's degree diploma, or a statement from the Candidate's MSc Advisor about the planned date of diploma obtaining
4. Copies of documents confirming scientific or professional achievements.
5. At least one letter of recommendation from a researcher with at least a PhD degree, concerning the candidate and his/her current scientific activity.
6. Application for admission to the Geoplanet doctoral school (Attachment no. 1).

Documents should be sent **via e-mail** to rekrutacja@cft.edu.pl from **01.04.2025** to **25.04.2025**. In the e-mail's title **please add the reference number AJ/05/2025**. Selected Candidates will be invited to an interview, to be held **in the third week of May** (**12.05 - 16.05**).

The scholarship will be awarded in accordance with the applicable laws in Poland and in accordance with the Resolution of the NCN Council no. 124/2022 of December 1, 2022, regarding the Regulations for the Awarding of NCN Scientific Scholarships in Research Projects Funded by the National Science Center, in the amount of **4 700 PLN net** for a **period of four years**, with the **first two years being funded as part** of the research project **MAESTRO 15** „**Dynamics of processes around compact stars**", financed by the **National Science Center** based on grant agreement no. **UMO-2023/50/A/ST9/00527**, and the subsequent two years being funded from other sources.

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The competition will be settled by 30.05.2025. Candidates will be informed electronically on the results of the competition. Admission to the GeoPlanet Doctoral School and the beginning of the scholarship are scheduled for **01.10.2025**.

Link to information on the GeoPlanet Doctoral School:

https://geoplanetschool.camk.edu.pl/doctoral-school/about-us/

Link to the Project Supervisor's website:

https://ajaniuk.cft.edu.pl/

If you have any questions, please send an e-mail to:

agnes@cft.edu.pl

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Attachment no. 1

APPLICATION FOR ENROLLMENT

in the GeoPlanet Doctoral School

1. Given name of the candidate: ……
2. Surname of the candidate: ……
3. Indicating the main research topic/theme and additional topics/themes - not more than 2 (if applicable): ……
4. E-mail address: ……
5. Correspondence address: ……
6. Subject of the Master's Thesis, the Supervisor: ……
7. Level of English: ……

Hereby I move for my enrollment in the GeoPlanet Doctoral School in

……..

I declare that I read the Regulations on the Recruitment to the GeoPlanet Doctoral School, I agree to the processing of my personal data by ……. (*please pro-vide the name of the Institute*) for realizing the recruitment process (pursuant with the Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation) (Journal of Laws, EU.L as of 2016 no. 119, page 1) - hereinafter: GDPR, and the domestic laws issued on its basis in the scope of personal data protection.

Date: …….. **Signature:** ……..

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Information clause in the recruitment process for studies:

In accordance with article 13 of Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data - General Data Protection Regulation (OJ EU L 119/1 of 4 May 2016), we inform that:

1. The entity deciding on how your personal data will be used is the Center for Theoretical Physics PAS represented by the Director with its registered office in Warsaw, Al. Lotników 32/46. You can contact the Administrator using one of the forms of contact provided on the website: http://www.cft.edu.pl/

2. The Center for Theoretical Physics PAS has appointed a Data Protection Officer (DPO), whom you can contact in matters concerning your personal data. You can contact the DPO by sending an email to the following address: iod@cft.edu.pl

3. Your personal data will be processed for the purpose of conducting the recruitment procedure for studies.

4. The provisions of the Law on Higher Education and Science (consolidated text: Journal of Laws of 2018, item 1668) apply to the processing of your personal data.

5. Your personal data will be processed for a period of 6 months after the end of the recruitment process and, in the case of admission to studies, in accordance with the course of studies, and will then be archived in accordance with applicable regulations.

6. Your personal data will not be made available to other entities, except for entities authorized under the law. Access to your data will be available to employees authorized by the administrator and members of university recruitment committees.

7. Providing your personal data is mandatory. Failure to provide them will prevent you from participating in the recruitment process.

8. You have the right to access the content of your data and the right to rectify it and limit its processing.

9. You have the right to lodge a complaint with the President of the Personal Data Protection Office if you believe that the processing of your personal data violates the provisions of the General Data Protection Regulation.

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I consent to the processing of my personal data by CTP PAS in order to ensure the conditions for full participation in the recruitment process for studies. I provide my personal data voluntarily and declare that they are true. I have read the content of the information clause, including information on the purpose and methods of processing personal data and the right to access the content of my data and the right to correct it.

…… **Date**, **candidate's signature**