

**RECRUITMENT FOR THE GEOPLANET DOCTORAL SCHOOL AT THE INSTITUTE OF  
GEOLOGICAL SCIENCES OF THE POLISH ACADEMY OF SCIENCES IN WARSAW, POLAND  
IN THE FRAMES OF THE NCN RESEARCH PROJECT,  
DISCIPLINE OF EARTH AND ENVIRONMENTAL SCIENCES,  
SPECIALIZATION SEDIMENTARY PETROLOGY AND GEOCHEMISTRY**

Recruitment to the GeoPlanet Doctoral School is carried out in the form of a competition. A person who has a Master's degree, a Master's degree in engineering or an equivalent degree may apply for the Doctoral School. The candidate should read carefully about the proposed research topic and contact the supervisor.

**Recruitment begins on December 1, 2020 and ends on February 1, 2021.**

Documents should be sent in electronic form by e-mail to: [ingpan@twarda.pan.pl](mailto:ingpan@twarda.pan.pl), [mbojan@twarda.pan.pl](mailto:mbojan@twarda.pan.pl)

**THE PROPOSED RESEARCH TOPIC OF THE PHD PROJECT:**

**“Comparative study of petrography, mineralogy and stable isotope geochemistry of ancient and modern hydrate-associated authigenic carbonates”**

*Methane (gas) hydrates are composed of crystalline water that encages methane gas. They are found under the seafloor along continents at specific pressure and temperature conditions. Changes of pressure or temperature at the seafloor driven by ocean warming or sea-level drop, may destabilize hydrates, which leads to CH<sub>4</sub> emission to the atmosphere. Since CH<sub>4</sub> is a much more effective greenhouse gas than CO<sub>2</sub>, widespread dissociation of hydrates is thought to have contributed to global warming in the past. Some of the most severe greenhouse conditions, such as the Paleocene-Eocene Thermal Maximum, and mass extinctions, e.g. the end-Permian extinction, are linked to massive and worldwide dissociation of hydrates. Methane-derived authigenic carbonates (MDACs) precipitate due to anaerobic oxidation of methane at cold seeps. Gas hydrates commonly occur in genetic association with and directly within some MDACs, which are termed “clathrites”. Since hydrates are not preserved in the rock record, ancient clathrites represent the only direct and tangible evidence of former hydrate occurrence, so they are particularly valuable research material. Yet, reports of fossil clathrites are scarce and their recognition is clearly underestimated. One of the potential reasons of their underrepresentation is that criteria for their recognition have not been set up.*

*This PhD project is aimed at elucidating the differences between modern and ancient clathrites, which will be achieved by careful research on MDACs from three ancient sections (Piedmont, Apennines, Carpathians) and those recovered from modern sediments at the Hydrate Ridge (offshore Oregon). The PhD student will collaborate with the researchers working on MDACs in these areas. Petrographic (optical microscopy, CL, SEM, EMP) and  $\delta^{13}\text{C}$  and  $\delta^{18}\text{O}$  analyses will be employed, which will enable identification of hydrate-inherited features and those related to processes postdating hydrate breakdown. The following specific research questions will be addressed:*

- *What were the processes that caused the differences between ancient and modern clathrites?*
- *To what extent can the actualistic approach be applied to fossil clathrites?*
- *Which ancient samples were formed in close association with hydrates and can thus be termed “clathrites”?*
- *Which features are diagnostic of a clathrite and which methods are the most valuable for this purpose?*
- *Was there a genetic link between formation/presence/dissociation of hydrate and carbonate precipitation?*
- *If so, how were these processes/compounds interrelated?*

*This PhD project will result in setting up well-constrained and comprehensive criteria for identification of fossil clathrites. This can contribute to the understanding of the true role of hydrates in the Earth's history, which can allow us to predict the potential consequences of future climate change and exploitation of gas hydrates.*

**Funding source:** National Science Centre (NCN), OPUS 19 Programme

**NCN project title:** Identification of clathrites in the geological record (ID: 2019/35/B/ST10/01332)

**Principal investigator:** Dr. hab. Maciej Bojanowski

**Scientific supervisor:** Dr. hab. Maciej Bojanowski

**Project summary on the NCN website:** <https://www.ncn.gov.pl/sites/default/files/listy-rankingowe/2020-03-16pfoa/streszczenia/483475-en.pdf>

**Application deadline:** 1.02.2021

**Announcement of recruitment results:** 15.02.2021

**Start of the employment:** 15.03.2021

**Duration of the employment:** 36 months

**Remuneration:** 3 000 PLN/month during the first 24 months, 4500 PLN/month during the next 12 months

**Location:** Institute of Geological Sciences, Polish Academy of Sciences, Warsaw, Poland

#### **WE OFFER:**

- Scientific work in one of the top Earth science research centers in Poland;
- Remuneration paid as a scholarship for the duration of the project, the amount is gross-gross 3000 PLN (currently ca. net 2300 PLN) per month for the first 24 months and gross-gross 4500 PLN for the next 12 months (36 months total);
- Participation in an interdisciplinary, innovative and international research project;
- Field work in the Carpathians, Piedmont and Apennines under the guidance of experienced researchers;
- Several research visits to collaborating institutions and laboratories in Europe and USA;
- Participation in at least three international sedimentological and geochemical conferences;
- A new laptop computer and fieldwork personal equipment;
- Extensive course of Polish language for foreigners;
- Possibility to obtain a doctoral degree under the supervision of Dr. hab. Maciej Bojanowski;
- Possibility to apply for additional internal and external funding to extend the time of employment and the amount of remuneration.

#### **REQUIREMENTS / EXPECTATIONS:**

- MSc degree in Earth sciences or a similar discipline (on the day of the interview at the latest);
- Enthusiasm for field work and Earth sciences;
- Determination and high commitment to pursue scientific career in the future;
- Good organizational skills and multiple task handling;
- Strong analytical and independent thinking skills;
- Ability to work both independently and in a team;
- Background in sedimentary petrology or geochemistry;
- Experience in geological field work and in laboratory works applied to sedimentary rocks using: optical microscopy, scanning electron microscopy, electron microprobe or similar facilities;
- Preferably experience in evaluation of mineralogical (XRD in particular), petrographic and geochemical (stable isotope in particular) data;
- Experience in scientific writing will be an additional advantage;
- Proficiency in both spoken and written English in order to allow for scientific discussions in an international team, reading scientific literature, presenting results at international conferences;
- Professionalism in approach to duties: reliability, persistence, open-mindedness, diligence.

#### **DUTIES / RESPONSIBILITIES:**

- Participation in the doctoral school organized at the IGS PAS ([geoplanetschool.pl](http://geoplanetschool.pl));
- Realization of the NCN project tasks, which includes most of all field (in Poland and Italy) and laboratory works (e.g., sample handling and preparation for analytical methods, optical and electron microscopy);
- The workplace will be the Institute of Geological Sciences PAS, Research Center in Warsaw, Poland, but the project also includes multiple trips abroad related to research and participation in conferences;
- Integration and interpretation of petrographic and geochemical data;
- Preparation and submission of scientific manuscripts and periodic reports;
- Presenting the results at international conferences (oral and posters);

## **REQUIRED DOCUMENTS:**

1. **Application** to the doctoral school with the agreement for the processing of personal data for the purposes of the recruitment and the information that the candidate has accepted the Recruitment Regulations for the GeoPlanet Doctoral School. **Application to the DS GeoPlanet - [Annex 1](#)**
2. **A copy of the master's diploma** or a certificate of the completion of the master studies.  
*Note: If the candidate does not have the abovementioned documents, she/he is expected to provide them before the admission to the doctoral school.*
3. **A list of the university marks** obtained during the first and second degree studies or a list of marks obtained during the Master's studies.
4. **A curriculum vitae** completed by the information about the education and employment career. **CV form - [Annex 2](#)**
5. **A cover letter** containing a short description of scientific interests, scientific achievements, list of publications, information on involvement in scientific activity (membership in university scientific associations, participation in scientific conferences, internships and trainings, awards and distinctions) and justification of the decision to undertake education in the Doctoral School. **A cover letter form - [Annex 3](#)**
6. **Certificates** or other documents proving the level of English proficiency, if the candidate possesses them.
7. At least one **recommendation letter** from the current academic supervisor or other academic staff about the candidate's current scientific activity.

**Note: Please do not sent any extra documents! Documents should be sent in one PDF file in the order as above (1-7).**

The recruitment process consists of two stages:

### **Stage 1 - evaluation of the provided documents**

- scientific achievements of the candidate (0-5 points) based on university marks, scientific and pop-science publications, patent applications, awards and distinctions resulting from scientific research or student activity, scholarships;
- candidate's scientific and professional experience (0-5 points) based on participation in conferences, workshops, training and internships, participation in research and commercial projects, involvement in societies and research clubs.

The candidate must obtain 6 points minimum in the first stage, so to be qualified for the second stage.

### **Stage 2 - an interview evaluated by the recruitment committee**

- candidate's knowledge of the discipline represented by the Institute (0-3 points);
- knowledge of the subject within the selected research topic chosen by the candidate (0-3 points);
- motivation and predisposition to the scientific work (0-4 points).

Candidates who obtain in total 10 points at maximum will not be accepted.

The Institute will inform candidates about the results within 14 days from the day of the last interview.

If the number of candidates admitted to the Doctoral School proves smaller than expected by the date of the end of the recruitment, the Institute will announce the supplementary recruitment.

## **FORM OF SUBMITTING DOCUMENTS:**

Applications should be submitted by 1<sup>st</sup> of February 2021 to the principal investigator of the project, Dr hab. Maciej Bojanowski via e-mail: [mbojan@twarda.pan.pl](mailto:mbojan@twarda.pan.pl) and to the Scientific Information Office of the Institute via e-mail: [ingpan@twarda.pan.pl](mailto:ingpan@twarda.pan.pl).

In the title of the message please indicate "**Clathrites**".

For additional information please contact:

**Dr hab. Edyta Zawisza** – The Coordinator of the GeoPlanet Doctoral School: [ezawisza@twarda.pan.pl](mailto:ezawisza@twarda.pan.pl)

**Dr hab. Maciej Bojanowski** – The principal investigator of the project: [mbojan@twarda.pan.pl](mailto:mbojan@twarda.pan.pl)