PhD positions at the Centre for functional and surface functionalized glass

PhD study program: Inorganic technologies and non-metallic materials
Study form: Full time

Length of the program: 4 years (full time)

Academic degree: „philosophiae doctor“ („PhD.“)

Graduates of PhD study program in the area of Inorganic Technology and Non-metallic Materials gain deep knowledge on scientific methods of research related to preparation of new types of non-metallic inorganic materials, with special focus on glass, ceramics, and surface modification of a broad range of various materials, including biomaterials. Graduates are able to solve problems related to inorganic technologies, development and characterization of new materials. They have special knowledge in the area of glass, inorganic binders, ceramic and refractory materials and inorganic additives. They have deep theoretical knowledge in the field of thermodynamics and kinetics and are capable of solving challenging engineering problems in technical practice. Graduates understand methods of studying structures as well as materials characteristics. They speak foreign languages, actively use computer and information systems, are able to work actively in teams, plan their own development within their research field and execute project management. Gained knowledge represents an excellent basis for obtaining a job either in academic or industrial research and development.

Dissertations topics for academic year 2017/2018:
(for abstracts, visit **http://vila.tnuni.sk/index.php?id=423**)

1. Structure and properties of hybrid inorganic-organic coatings based on nanomaterials

2. A model for the relationships between structure and thermodynamics in phosphate glasses

Supervisor: Prof. M. Liška
Partner research institution: CSIC - Spanish National Research Council (Spain, supervised by prof. A. Durán)

3. Synthesis and photoluminescence properties of phosphors based on stoichiometric aluminates, silicates and alumina-silicates for applications in pc-WLEDs

Supervisor: dr. R. Klement
Partner research institution: Friedrich Schiller University Jena (Germany, supervised by prof. L. Wondraczek)

4. Preparation and luminescence study of long lasting phosphors with melilite structure

Supervisor: dr. R. Klement
Partner research institution: Friedrich Schiller University Jena (Germany, supervised by prof. L. Wondraczek)

5. Mesoporous and hollow glass microspheres for selective targeting of cancer cells

Supervisor: prof. D. Galusek
Partner research institution: Friedrich-Alexander University Erlangen-Nürnberg (Germany, supervised by prof. A. Boccaccini)

6. Bioglasses with tailored release of therapeutic ions

Supervisor: prof. D. Galusek
Partner research institution: Friedrich-Alexander University Erlangen-Nürnberg (Germany, supervised by prof. A. Boccaccini)

7. Corrosion protection of metal using integrated self-healing systems

Supervisor: prof. D. Galusek
Partner research institution: CSIC - Spanish National Research Council (Spain, supervised by prof. A. Durán)

8. Geopolymer-like porous materials from engineered mixtures of inorganic waste

Supervisor: prof. D. Galusek
Partner research institution University of Padova (Italy, supervised by prof. E. Bernardo)

9. Additive manufacturing of polymer-derived glass-ceramics

Supervisor: prof. D. Galusek
Partner research institution University of Padova (Italy, supervised by prof. E. Bernardo)

What we offer

- Study in a newly established Centre for functional and surface functionalized glass (FunGlass) funded from H2020 program
- Scholarship to cover the living cost during study
- Unique opportunity to play an important role in the European project integrating significant international experience
- Research and studies in two partnering institutions simultaneously
- In the frame of the study minimum of 1 year internship with one of the international partners at their home sites in Germany, Italy, or Spain under supervision of world leading scientists in the field
- Opportunity to spend shorter training internships (up to 3 months) at other research institutions in EU.
- Travel allowance to cover the cost of internship at partners' institutions
- Access to international know-how and expertise with top research institutions
- Access to high-end laboratories and equipment
- Opportunity to earn double PhD degrees

Requirements

The eligible candidate should

- Have a M.Sc./graduate degree in inorganic materials and technology, and materials science and engineering. Graduates from related field, such as physical chemistry, chemical physics, inorganic chemistry, organic and organometallic chemistry, analytical chemistry, chemical engineering, biochemistry, physics, and theoretical chemistry, with the desire for independent laboratory work are also eligible.
- Possess high English proficiency skills
- Strive for excellence and be able to focus on solving scientific problems
- Be a team player of high cultural awareness
- Submit the application package by July 31, 2017

How to apply

Regarding application process, please, contact Personal Manager Ms. Marcela Brodová (marcela.brodova@tnuni.sk) who will provide you with application forms to be submitted. The deadline for submission of all documents is July 31, 2017.

All documents need to be submitted in English. Your application package will not be returned. It needs to include the following:

- Application form
- Cover letter, including research interest description
- CV
- Copy of diploma

For more information

Regarding additional scientific information, please, contact Director Prof. Dusan Galusek (dusan.galusek@tnuni.sk).

Institutional / project background information:

The study will take place at the Alexander Dubcek University of Trenčín, at the **CENTRE FOR FUNCTIONAL AND SURFACE-FUNCTIONALIZED GLASS** (FunGlass) a new research centre established with financial support from the 8th European Framework program for Research and Innovation HORIZON 2020. The centre was created in a close cooperation with leading institutions of research and innovation in the field of glass, namely Friedrich-Alexander University Erlangen-Nürnberg (Germany, represented by prof. A. Boccaccini), Friedrich Schiller University Jena (Germany, represented by prof. L. Wondraczek), Spanish National Research Council (Spain, represented by prof. A. Durán) and University of Padova (Italy, represented by prof. E. Bernardo).

The centre is specialized in cutting edge research in the field of glass with special functional properties (luminescence, electric), and to functionalization of conventional glass with the aim of modifying its properties, and adding new functionalities. These comprise reflection, and anti-reflection coatings for solar energy production and optoelectronic applications, increase of glass strength, enhancing the corrosion and leaching resistance of commercially produced glasses, self cleaning/antibacterial coatings of glasses for medical applications, including modification/enhancement of bioactivity. The research topics also include utilization of waste materials for production of glasses and glass-ceramic materials with high added value. The Centre is equipped with up-to-date research infrastructure (for details see http://centratech.tnuni.sk/?page_id=6864), with substantial upgrade of experimental facilities planned in the frame of the project in 2018 and 2019.