

**Name of the advisor: Jan Franz****Academic title: Ph.D., D. Sc.**Orcid ID number: <https://orcid.org/0000-0002-4279-0608>**Department of Theoretical Physics and Quantum Informatics****Faculty of Applied Physics and Mathematics****Gdańsk University of Technology****Phone: 0048 58 347 2889****E-mail: janfranz@pg.edu.pl****Personal web page: www.pg.edu.pl/janfranz****Discipline<sup>i</sup> Physics****Bibliometric indicators**

1.	Number of journal publications in WoS/ Scopus	29 / 29
2.	Citations (WoS/Scopus) excluding self-citations	299 / 286
3.	Hirsch index (WoS/Scopus)	11 / 11
4.	Hirsch index in Google Scholar	12
5.	Citations in Google Scholar	413

1. The number of PhD students who have graduated under your supervision: 0

2. The number of PhD students currently supervised: 0

3. Are you currently accepting new PhD students:

- a. Polish Yes
- b. Foreign Yes

**Research interests or topics offered for PhD research (no more than 2000 characters)<sup>ii</sup>**

1.) The role of molecular anions in astrochemistry:

In 2006 astronomers have detected molecular anions in the interstellar space. It is still unknown, how these anions have formed under the physical conditions of the interstellar space. The aim of our research is to investigate various mechanisms for the formation and destruction of the anions with theoretical and computational methods. The student will learn how to use quantum chemistry computer program packages to explore the potential energy surfaces and to use quantum dynamics software to calculate cross sections and chemical reaction rates.

2.) Collisions of electrons and positrons with atoms and molecules:

Together with my collaborators I have developed several theoretical methods for the calculation of cross sections for collisions of electrons and positrons with atoms and molecules. These methods are limited to collision energies between about one and ten eV. The aim of the project will be to develop new theoretical methods in order to be able to describe processes at higher energies (including ionization) and at lower energies (including attachment processes). These processes are relevant for simulation of plasmas and are important for the development of the nuclear fusion reactor ITER.

3.) Transport and lifetime of positrons in gases and condensed matter:

Positrons are used in positron emission tomography (PET) positrons to detect cancers in the human body. The aim of this project is to develop a physical model for simulations of positrons in biological material. This will result in a better understanding of the limitations of this technology. The student will be involved in the development of a theoretical model for the transport of positrons in water. This model will be used in Monte Carlo simulations to calculate the range of positrons in biological materials.

PhD Advisor form

**Funding or special equipment needed to carry out a PhD project<sup>iii</sup>:**

1. Is funding available for experimental work: Not applicable
2. Is the equipment needed to complete a PhD project available in your lab/department: Not applicable

**Most recent publications in WoS/SCOPUS journal – no more than 5 published after 1.01.2017**

No	Authors/title/journal	Journal IF/Quartile – for WoS and SNIP/ CiteScore for SCOPUS	Publication year
1.	Jan Franz Positron-electron correlation-polarization potentials ... European Physical Journal D	1.393 /	2017
2.	Jan Franz The POCOBIO Database for Computed Scattering Cross-Sections ... Acta Physica Polonica A	0.469 /	2017
3.	Jan Franz and Malgorzata Franz Low-energy positron scattering from gas-phase benzene submitted to European Physical Journal D	1.393 /	2019
4.			
5.			

**Most recent externally funded projects you were involved in – no more than 3**

No	Project title, the name of the Princ. Investigator (PI) and the institution the project was carried out	Year awarded	Role in the project
1.	Title: Low-energy electron (and positron) scattering on atoms and molecules - experiments and theory. PI: dr hab. Kamil Fedus (Torun). Institutions: Nicolaus Copernicus Univ. and PG.	2014-2018	R
2.	Title: Investigation of rotational state-changing collisions of CCN <sup>-</sup> ions with helium. PI: dr hab. Jan Franz (Gdansk). Institutions: PG and University of Innsbruck (Austria)	2018	PI
3.	Title: Electron and positron scattering on atoms and molecules PI: dr hab. Jan Franz Institution: WCSS Wroclaw Centre for Networking and Supercomputing	since 2016	PI

## PhD Advisor form

### **Additional relevant information – (no more than 1600 characters)<sup>iv</sup>**

Co-supervisor of one PhD-student

Period of time: 11/2006 - 10/2010

Institution: Department of Physics and Astronomy, University College London (UCL), London, UK

Awards: The student received the Great Britain-China educational award for the thesis.

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<sup>i</sup> You may select up to two disciplines out of 12 disciplines represented in the Doctoral School

<sup>ii</sup> Observe the limit of not more than 300 words

<sup>iii</sup> Leave only one answer

<sup>iv</sup> Add any other relevant information eg. awards for PHD students whom you supervised (no more than 200 words)