SUPRAMOLECULAR CHEMISTRY

Moscow Institute of Physics and Technology (National Research University)

Degree or qualification is awarded: **PhD (Candidate of Science)**

Language of study: **English**
Mode of study: **full-time**
Duration: **4 years**
Availability of free education: **yes**
Price: **375 000 RUB**

Programme webpage at the university website: https://eng.mipt.ru/programs/supramolecular-chemistry/

Programme curator: **Denis Ustyuzhaninov**
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Entry requirements:

- Master's degree / equivalent in a related field
- B2 level of English
- Good track record of publications related to the topic of the intended research
- Strong research proposal 1,500 - 3,500 words

Research supervisor:
Natalia Lobova
PhD

Supervisor's research interests:
Since the 1980th supramolecular chemistry also known as the chemistry of weak interactions become one of the most interesting fields of chemistry. This discipline describes the relations between receptor and substrate, host and guest. This approaches leads us to nature-like technologies such as sensor systems, molecular machines and devices.. My interest concerns to fluorescent systems, organic dyes and their complexes with cavitands.

Research highlights:
As it was shown earlier, the molecular machines based on organic dyes are able to work in aqueous media. Our goal is development of different approaches to novel effective molecular devices for sensor systems or dyes for laser technics. Our work was supported by grants from the Russian Science Foundation and the Russian Foundation for Basic Research.

Supervisor's specific requirements:

- Physical chemistry.
- Organic chemistry.
- Physics.
- Confident user in Word, Excel, PowerPoint, Origin, ChemDraw.
- Analytical chemistry background is welcome.

Main publications:

- Martyanov T.P., Vedernikov A.I., Ushakov E.N., Sazonov S.K., Aleksandrova N.A., Lobova N.A., Kuz'mina L.G., Howard J. A.K., Alfimov M.V., Gromov S.P. "Pseudodimeric complexes of 4-styrylpyridine derivatives: structure–property relationships and a stereospecific [2+2]-crossphotocycloaddition in solution." // Dyes Pigments.- 2020.-V. 172.-107825. https://doi.org/10.1016/j.dyepig.2019.107825. (Q1).

- Vedernikov A.I., Lobova N.A., Kuz'mina L.G., Fomina M.V., Strelenko Y.A., Howard J.A.K., Gromov S.P. "Self-assembly of cucurbiturils and cyclodextrins to supramolecular millstones with naphthalene derivatives capable of translocations in the host cavities." // New. J. Chem.-2019.-V. 43.-No. 9.-P. 3673-3689. DOI: 10.1039/c8nj04685a.
- Gromov S.P., Vedernikov A.I., Lobova N.A., Kuz'mina L.G., Dmitrieva S.N., Strelenko Yu.A., Howard J.A.K. "Synthesis, Structure, and Properties of Supramolecular Photoswitches Based on Ammonioalkyl Derivatives of Crown-Ether Styryl Dyes" // J. Org. Chem.-2014.-V. 79.-No. 23.- P. 11416−11430.

Specializations within this programme