

# OPTICAL PROPERTIES OF CARBON NANOSTRUCTURES

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/optical-properties-of-carbon-nanostructures/>

Programme curator: **Denis Ustyuzhaninov**

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**Research supervisor:**

[Elena Obraztsova](#)

PhD

**Supervisor's research interests:**

Our research interests are focused on synthesis, comprehensive optical characterization and new applications of carbon nanostructured materials (single-wall carbon nanotubes, graphene, carbon onions, carbon peapods, graphene nanoribbons inside carbon nanotubes and on metallic surfaces. Main applications are: ultrafast beam modulators for solid state lasers and transparent conductive electrodes.

**Research highlights:**

We are one of the first laboratories in Russia started studies of single-wall carbon nanotubes and graphene. We have a whole line of equipment for studies of carbon nanomaterials from synthesis to applications. We have a close collaboration with laboratories in Finland, France, Spain, Taiwan, Vietnam. 14 PhD theses have been defended under my supervision since 2000.

**Supervisor's specific requirements:**

- University degree in Physics.
- Strong background in condensed matter physics and optics.
- Skills in experimental optics and laser physics.

**Main publications:**

- W. Wenseleers, I.I. Vlasov, E. Goovaerts, E.D. Obraztsova, A.S. Lobach, A. Bouwen "Efficient Isolation and Solubilization of Pristine Single Wall Nanotubes in Bile Salt Micelles", *Advanced Functional Materials* 14 (2004) 1105-1112.
- Max A. Solodyankin, Elena D. Obraztsova, Anatoly S. Lobach, Alexander I. Chernov, Anton V. Tausenev, Vitaly I. Konov, Evgueni M. Dianov "1.93 mm modelocked thulium fiber laser with a carbon nanotube absorber", *Optics Letters* 33 (2008) 1336-1338.
- A.A. Tonkikh, V.I. Tsebro, E.A. Obraztsova, D.V. Rybkovskiy, A.S. Orekhov, I.I. Kondrashov, E.I. Kauppinen, A.L. Chuvilin, E.D. Obraztsova "Films of filled single-wall carbon nanotubes as a new material for high-performance air-sustainable transparent conductive electrodes operating in a wide spectral range", *Nanoscale* 11 (2019) 6755-6765.

## **Specializations within this programme**