RNDr. Jan KUNC, Ph.D.
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Personal Information

Marital status: single
Nationality: Czech Republic
Age: 33
Place of birth: Kolín, Czech Republic

Objective

Optical and electronic properties of condensed matter systems, many-body phenomena, semiconductor heterostructures, CdTe, GaAs, SiC, graphene.

Professional experience

Georgia Institute of Technology, Atlanta, USA
Postdoctoral stay (2011-2014)

- Growth and characterization of epitaxial graphene grown by thermal decomposition of SiC.
- Graphene-based device fabrication and characterization

Grenoble High Magnetic Field Laboratory, Grenoble, France
Two short-term stays (2006-2007)

- 4-5/2007 Single-dot spectroscopy of CdTe quantum dots with single manganese ion.
- 11-12/2006 Development of the software for operation of micro-positioners dedicated for photoluminescence mapping.

Institute of Physics, Charles University, Prague, Czech Republic
Student project (2004-2005)

- Experimental study of CdTe nanocrystals
- Study of optical and electro-optical properties

Czech Metrology Institute, Prague, Czech Republic
Student project (2004-2005)

- Construction of Shack-Hartmann wavefront detector
- Software development in Delphi

Acoustic center, Prague, Czech Republic
Noise measurements in industrial and residential areas (11/2004-5/2005)

- Measurements, analysis and evaluation of the noise pollution.
- Preparing protocols.

Education

Université de Grenoble, Grenoble, France (2007-2011) and
Charles University, Prague, Czech Republic (2006-2011)

Doctoral degree, En Cotutelle doctoral study between Université de Grenoble and Charles University in Prague

- The thesis successfully defended on February 14th 2011
- French part of the thesis supported by the scholarship of French government
- Specialization: Physique des materiaux at Université de Grenoble and Quantum optics and optoelectronics at Charles University.
- The main, experimental part of the thesis took place in the Grenoble High Magnetic Field Laboratory, France.
- Thesis topic: High mobility two-dimensional electron gas in CdTe quantum wells: High magnetic field studies.

Charles University, Prague, Czech Republic (2001-2006)

Master degree, Charles University, Faculty of Mathematics and Physics

- Graduated 6/2006 with distinction, *cum laude*
- Excellence scholarships granted repeatedly during the studies
- Specialization: Quantum and non-linear optics
- Thesis topic: Carrier dynamics in CdTe, ultra-fast carrier dynamics in CdTe studied by means of femtosecond pump-probe spectroscopy and self-diffraction.

Areas of Expertise

Experience in:

- Measurements of photoluminescence, photoluminescence excitation, Raman scattering, Fourier transform far infrared spectroscopy
- Magneto-transport, integer and fractional quantum Hall effect
- Single dot spectroscopy of CdTe quantum dots with single manganese atoms
- Ultra-fast time resolved self-diffraction and spectrally resolved pump-probe experiments, harmonic generation
- Experiments at high magnetic fields (up to 34 T)
- Low-temperature instrumentation (^{4}He cryostats - down to 1.3 K)
- Low-noise electronic measurements (phase sensitive Lock-in signal detection)
- Hardware programming in LabView
- Complex data analysis (automated analysis of large data sets, local maxima/minima searching in noisy data, non-negative factorization)
- Growth of epitaxial graphene
- Ellipsometry
- Atomic Force Microscopy (AFM), Electrostatic Force Microscopy, Scanning Kelvin Probe Microscopy, current AFM, contact and non-contact modes
- Wire bonding
- Scanning Electron Microscopy and electron beam lithography
- Spin coating, resist development, lift-off
- Capacitance-voltage semiconductor device characterization

Basic experience in:

- Low-temperature instrumentation for mK temperatures (^{3}He/^{4}He dilution refrigerator - down to 80 mK)
- Using microwaves in experiments (waveguides, coaxial cables and their preparation)
- Hardware programming using Matlab

Computer skills

- Programming languages: LabView, Delphi, HTML, basics in C/C++
- Programs: Latex, CAD design, Word, Excel, Access, Corel draw, Gimp
- Data analysis and numerical simulations: MATLAB, Maple, Origin
- Operation systems: Microsoft Windows, UNIX (basics)

Language skills

English	advanced, spoken and written
French	basic knowledge
German	basic knowledge
Czech	native speaker