

Curriculum Vitae for Brian Julsgaard



Education:

1995-2003; Student at Aarhus University, Dept. of Physics and Astronomy.

1999-2003; PhD-studies at Aarhus University, Dept. of Physics and Astronomy.

June 15, 2001; Master's Degree in Physics awarded.

Dec. 15, 2003; PhD Degree in Physics, thesis title: *Entanglement and Quantum Interactions with Macroscopic Gas Samples*.

Employment:

Aug. 2003–Dec. 2004; Postdoc at the Niels Bohr Institute, Copenhagen University.

Jan. 2005–Dec. 2006; Postdoc. (Carlsberg Fellow) at the University of Lund, Sweden.

Jan. 2007–Mar. 2008; Postdoc. (Carlsberg Fellow) at the Technical University of Denmark.

Apr. 2008–May 2011; Postdoc. (Steno Fellow) at the Dept. of Physics and Astronomy, Aarhus University.

Jun. 2011–Dec. 2012; Postdoc. (theoretical) at the Dept. of Physics and Astronomy, Aarhus University.

Jan. 2013–present; Associate professor at the Dept. of Physics and Astronomy, Aarhus University.

Scientific focus areas:

Interaction between light and matter has been my main research subject since my PhD-studies began in 1999. This has included:

- A variety of physical systems: (i) Semiconducting films and nanostructures – including Si, Ge, Sn, GeSn, InAs, GaN, SiC, (ii) rare-earth-metal ions in inorganic host materials, (iii) atomic vapors, (iv) nitrogen-vacancy centers in diamond, (v) materials for radiation detection.
- A variety of scientific contexts: (i) Semiconducting materials for light emission, solar cells, quantum optics, and fundamental physics, (ii) inorganic materials for improved solar cells using optical upconversion, (iii) quantum entanglement, quantum memory, quantum communication, (iv) 2D and 3D detection of radiation doses.
- A variety of experimental laser-based techniques: (i) Time-resolved and steady-state photoluminescence spectroscopy, (ii) high-speed and low-noise detection schemes, (iii) polarization analysis, (iv) coherent laser control, (v) pump-probe spectroscopy.
- A variety of developed theoretical models for: (i) Behavior of semiconducting nanocrystals, (ii) laser systems, (iii) rare-earth-ion dynamics in upconverters, (iv) quantum memories in inhomogeneously broadened spin systems, (v) fundamental quantum mechanics, (vi) coupled strain and diffusion equations.

Also experience with non-optics topics: Synthesis and characterization of materials, nanoscience.

Teaching and education:

Main responsible for teaching activities at the Dept. of Physics and Astronomy at Aarhus University in Laser Physics (2009-2011), Quantum Mechanics (2014-present), and Semiconductor Physics (2017-present).

Shared responsibility for Materials Science (2016-2017). Member of the PhD committees at the Dept. of Physics and Astronomy and at the Faculty of Natural Sciences, Aarhus University.

Awards:

(1) The Aarhus University Research Foundation PhD-price 2004.

(2) The Allan Machintosh Travel Grant for Outstanding Research in Natural Sciences, 2004.