

Stéphane Berciaud

Date of birth July 17 1979

Nationality French

Spoken languages French (mother language)
English (spoken and written TOEIC level 3)
Spanish (spoken and written)
German (spoken and written)

Professional address Columbia University – Department of Chemistry
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Current Occupation

08/2007- Joint **postdoctoral scholar** at Columbia University in the groups of Prof. Louis Brus (Chemistry) and Prof. Tony Heinz (Physics).
Project: Optical studies of individual carbon nanotubes and graphene devices.
[Link to research group](#)

Postdoctoral experience

12/2006- **Postdoctoral scholar** at University Bordeaux in the Nanophotonics group of
07/2007 Centre de Physique Moléculaire Optique et Hertzienne (CPMOH).
Project: Time resolved photoluminescence and optical spectroscopy of individual carbon nanotubes at low temperature.

Academic Education

2006 Ph-D at University Bordeaux (defended on December 1st 2006)
Project: Photothermal heterodyne imaging and absorption spectroscopy of individual nano-objects. Advisor: Prof. Brahim Lounis
[Link to manuscript \(French Version\) and defence slides \(English Version\)](#)

- 2003** “DEA de physique quantique”(M.Sc.) at Ecole Normale Supérieure (ENS Paris)
Research in the “Laboratoire de Photonique Quantique et Moléculaire” (LPQM, ENS Cachan) supervised by Prof. J.F. Roch.
Project: Modification of the radiative lifetime of fluorescent molecules embedded in ultrathin dielectric films.
- 2002** “Agrégation de sciences physiques (option physique)”
- 2001** “Maîtrise de physique fondamentale” at University Paris XI (Orsay)
Research in the Atomic and Optical Physics Laboratory (Indian Institute of Science, Bangalore, India) supervised by Prof. V. Natarajan
Project: Laser cooling and trapping of Yb^+ ions in a linear Paul trap.
- 2000** “Licence de physique fondamentale” (equivalent to a B.Sc.) at University Paris XI
Research at Ecole Supérieure de Physique et Chimie industrielles (ESPCI, Paris).
Project: Control of two-dimensional turbulence in wakes behind bluff bodies
- 1999-2003** Student at the physics department of ENS Cachan (www.physique.ens-cachan.fr)
- 1997-1999** “Classes Préparatoires” (4 semesters in Mathematics, Physics and Chemistry) at Lycée Montaigne (Bordeaux)

Teaching Experience

- 2003-2006** “Monitorat” (96 hours/year) at university Bordeaux: Electronics (1st year), Classical and Non-Linear Optics (1st to 5th year), Atomic Physics (4th year)
- 2002-2003** General Physics (1st year) oral tests at Lycée Saint-Louis in Paris

Technical skills

- Absorption and emission spectroscopy of individual nano-objects.
- Single particle fluorescence microscopy (confocal and wide-field)
- Time resolved photon counting
- Use and maintenance of Laser systems (cw, tuneable dye lasers, pulsed lasers)
- Data analysis and/or simulations using MATLAB, MAPLE, ORIGIN
- Work experience with custom made LABVIEW programs.

Others

- Member of the council of CPMOH as representative of the non-permanent staff
- Organization of student seminars at CPMOH

Publications

- [1] “Photothermal heterodyne imaging of individual nonfluorescent nanoclusters and nanocrystals”
S. Berciaud, L. Cognet, G.A. Blab & B. Lounis
Phys. Rev. Lett., **93**, 257402, (2004)
- [2] “Observation of Intrinsic Size Effects in the Optical Response of Individual Gold Nanoparticles”
S. Berciaud, L. Cognet, P. Tamarat & B. Lounis
Nano Letters, **5**, 515-518, (2005)
- [3] “Photothermal Absorption Spectroscopy of Individual Semiconductor Nanocrystals”
S. Berciaud, L. Cognet & B. Lounis
Nano Letters **5**, 2160-2163, (2005)
- [4] “Optical Readout of Gold Nanoparticle-Based DNA Microarrays without Silver Enhancement”
G. A. Blab, L. Cognet, S. Berciaud, I. Alexandre, D. Husar, J. Remacle & B. Lounis
Biophysical Journal **90**, L13-L15, (2006)
- [5] “Photothermal Heterodyne Imaging of Individual Metallic Nanoparticles: Theory versus Experiments”
S. Berciaud, D. Lasne, G.A. Blab, L. Cognet & B. Lounis
Physical Review B **73**, 045424, (2006)
- [6] “Absorption and scattering microscopy of single metal nanoparticles”
M. A. van Dijk, A. L. Tchebotareva, M. Orrit, M. Lippitz,
S. Berciaud, D. Lasne, L. Cognet & B. Lounis
Phys. Chem. Chem. Phys. **8**, 3486, (2006)
- [7] “Single Nanoparticle Photothermal Tracking (SNaPT) of 5-nm Gold Beads in Live Cells”
D. Lasne, G. A. Blab, S. Berciaud, M. Heine, L. Groc, D. Choquet, L. Cognet & B. Lounis
Biophysical Journal **91**, 4598, (2006)
- [8] “Absorption spectroscopy of individual single walled carbon nanotubes”
S. Berciaud, L. Cognet, P. Poulin, R.B. Weisman & B. Lounis
Nano Letters **7**, 1203 (2007)

Patent

“Détection photothermique hétérodyne de nano-objets non fluorescents”

B. Lounis, L. Cognet & S. Berciaud

07/07/04, CNRS N° F0407548

Conference Contributions

Invited Conference

[1] “Absorption spectroscopy of individual nano-objects”

S. Berciaud, D.Lasne, G.A. Blab, L. Cognet, and B. Lounis

Photonic Nano-Objects (Les Houches, France 21-26/01/2007)

Oral presentations

[2] “Photothermal imaging of individual metallic nanoparticles. Application to membrane proteins detection.”

S. Berciaud, C. Tardin, L. Cognet, G. A. Blab, et B. Lounis.

Opt Diag (Diagnostic and Optical Imaging in Medicine, Paris May 2004)

[3] “Photothermal imaging and absorption spectroscopy of individual metallic nanoparticles”

S. Berciaud, D.Lasne, G.A. Blab, L. Cognet, and B. Lounis

PhoPhoBo (Phonons Photons Bordeaux, April 2005)

[4] “Photothermal heterodyne detection and absorption spectroscopy of individual metallic nanoparticles”

S. Berciaud, L. Cognet, G.A. Blab, D.Lasne, P. Tamarat, and B. Lounis

EQEC (München, June 12-16 2005):

[5] “Photothermal imaging and absorption spectroscopy of individual gold nanoparticles”

S. Berciaud, D. Lasne, G.A. Blab, L. Cognet, and B. Lounis

OrNano (Interdisciplinary meeting on gold nanoparticles, Paris, June 30-July 1 2005):

[6] “Photothermal absorption spectroscopy of individual semiconductor nanocrystals”

S. Berciaud, D.Lasne, G.A. Blab, L. Cognet, and B. Lounis

CLEO/QELS (Long Beach, California, May 21-26 2006)

Posters

[1] “Detection and spectroscopy of individual non-fluorescent nano-objects”

S. Berciaud, G.A. Blab, L. Cognet & B. Lounis

9èmes Journées de la matière condensée (Nancy, August 30-September 3 2004)

[2] “Absorption spectroscopy of individual single walled carbon nanotubes ”

S. Berciaud, L. Cognet, P. Poulin. R.B. Weisman & B. Lounis

Photonic Nano-Objects (Les Houches, France 21-26/01/2007)