

## Florian FORMANEK, PhD

### Sony Corporation

Materials Laboratories, Life Science Laboratory  
Sony Bioinformatics Center, Tokyo Medical and Dental University  
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French, born June 16, 1978

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## Doctor in Physics

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### Education

- 2002 - 2004     **PhD, "Development of a near-field scanning optical microscope working in the visible, in the infrared, with or without illumination".**  
Paris VI University, France.  
Directors: Prof. A.C. Boccara and Dr. Y. De Wilde  
Physical Optics Laboratory - ESPCI, Paris, France.
- 2000 - 2001     **MS, Solid State Physics.**  
Paris XI University, France.
- 1998 - 2000     **BS, Physics.**  
Lyon I University, France.

### Experience

- Since Jan. 2006     **Project Researcher.** Sony Corporation, Materials Laboratories,  
Life Science Laboratory, Tokyo Medical and Dental University, Japan.
- Nov. 2004 - Nov. 2006     **Post Doctoral fellowship - JSPS.**  
Nanophotonics Laboratory - RIKEN, Wako, Japan.  
Director: Prof. S. Kawata  
*Three-dimensional fabrication of polymer and metallic nano/microstructures by two-photon polymerization.*
- 2002 - 2004     **Teaching assistant.** École Centrale Paris, Châtenay-Malabry, France.  
*Experimental and methodological training in optical, scanning and electron microscopy.*
- May-July 2000     **Training period.** Astronomy Department - Oulu University, Finland.  
*Spectroscopic study and Doppler imaging of an eclipsing binary system.*
- July 1999     **Temporary employment.** Instrumentation Department - Rhodia Belle-Etoile,  
Sanofi-Aventis Group, Saint-Fons, France.  
*Reorganization of the computer and technical databases.*

### Professional skills

- Optical and electron microscopy.
- Atomic Force Microscopy (AFM), Near-field Scanning Optical Microscopy (NSOM): visible, infrared, liquid media, Raman spectroscopy, high temperature, without illumination.
- Two-photon absorption fabrication: selective electroless plating metallization, parallel fabrication.
- Lasers: visible, infrared, femtosecond.
- Programming: Visual C++, Matlab.
- Miscellaneous: lock-in, infrared detector, FTIR, nano/micropositioning, machine tool...

## Languages

French (native), English (fluent)  
Italian - Spanish - Japanese (fair knowledge)

## Awards and Honors

- Erasmus grant from the European Commission, 2000.
  - Best presentation award, APNFO4 - 4th Asia-Pacific International Conference on Near-Field Optics, Taroko (Taiwan), 2003.
  - Postdoctoral research grant from the Japan Society for the Promotion of Science (JSPS), 2004.
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## Publications

*The radial velocities and physical parameters of ER Vul.*

R. Duemmler, C. Doucet, F. Formanek, I. Ilyin, I. Tuominen.  
Astronomy & Astrophysics, **402**, 745 (2003).

*Comparison of test images obtained from various configurations of scanning near-field optical microscopes.*

C. Bainier, C. Vannier, D. Courjon, J.-C. Rivoal, S. Ducourtieux, Y. De Wilde, L. Aigouy, F. Formanek,  
L. Belliard, P. Siry, B. Perrin.  
Applied Optics, **42**, 691 (2003).

*Imaging subwavelength holes using an apertureless near-field scanning optical microscope.*

F. Formanek, Y. De Wilde, L. Aigouy.  
Journal of Applied Physics, **93**, 9548 (2003).

*Apertureless near-field scanning optical microscope based on a quartz tuning fork.*

Y. De Wilde, F. Formanek, L. Aigouy.  
Review of Scientific Instruments, **74**, 3889 (2003).  
(This paper was selected for the August 2003 issue of Virtual Journal of Nanoscale Science & Technology, Vol.8, Issue 5)

*Apertureless scanning near-field fluorescence microscopy in liquids.*

A. Fragola, L. Aigouy, P.Y. Mignotte, F. Formanek, Y. De Wilde.  
Ultramicroscopy, **101**, 47 (2004).  
(Science Direct Top25 hottest articles within the journal Ultramicroscopy, Oct-Dec 2004)

*Scattering probes: From 2-D to 3-D near field imaging.*

G. Moneron, A. Fragola, F. Formanek, L. Willame, A. Dubois, L. Aigouy, Y. De Wilde, S. Grillon,  
A. C. Boccara.  
Chapter of the book "Nanophotonics", Volume 1, editors H. Masuhara and S. Kawata, Elsevier,  
pp 139-152 (2004).

*Nanometer-scale probing of optical and thermal near-fields with an apertureless NSOM.*

F. Formanek, Y. De Wilde, L. Aigouy, W.K. Kwok, L.Paulius, Y. Chen.  
Superlattices and Microstructures, **36**, 315 (2004).  
(Science Direct Top25 hottest articles within the journal Superlattices and Microstructures, Jul-Sep 2004)

*Apertureless NSOM working with or without laser source.*

F. Formanek, Y. De Wilde, L. Aigouy, Y. Chen.  
Scanning, **26**, 63 (2004).

*Analysis of the measured signals in apertureless near-field optical microscopy.*

F. Formanek, Y. De Wilde, L. Aigouy.  
Ultramicroscopy, **103**, 133 (2005).

*Three-dimensional fabrication of metallic nanostructures over large areas by two-photon polymerization.*

F. Formanek, N. Takeyasu, T. Tanaka, K. Chiyoda, A. Ishikawa, S. Kawata.  
Optics Express, **14**, 800 (2006).  
(This paper was selected for the May 2006 issues of the Virtual Journal of Nanoscale Science & Technology, Vol.13, Issue 19 ; and the Virtual Journal of Ultrafast Science, Vol.5, Issue 5)

*Selective electroless plating to fabricate complex 3D metallic micro/nanostructures.*

F. Formanek, N. Takeyasu, T. Tanaka, K. Chiyoda, A. Ishikawa, S. Kawata.  
Applied Physics Letters, **88**, 083110 (2006).

*Three-dimensional fabrication of metallic micro/nanostructures by two-photon polymerization for metamaterials.*

F. Formanek, N. Takeyasu, T. Tanaka, K. Chiyoda, A. Ishikawa, S. Kawata.  
Proc. SPIE, **6324**, 63240T (2006).

*Site-selective metal deposition on 3D micro/nanostructures fabricated by two-photon polymerization.*

N. Takeyasu, F. Formanek, K. Chiyoda, T. Tanaka, A. Ishikawa, S. Kawata.  
Proc. SPIE, **6324**, 63240W (2006).

*Investigation of dyed humanhair fibers using apertureless near-field optical microscopy.*

F. Formanek, Y. De Wilde, G. Luengo, B. Querleux.  
J. Microscopy, **224**, 197 (2006).

*Thermal radiation scanning tunneling microscopy.*

F. Formanek, Y. De Wilde, R. Carminati, B. Gralak, P.-A. Lemoine, K. Joulain, J.-P. Mulet, Y. Chen, J.-J. Greffet.  
Nature, **444**, 740 (2006).

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## Presentations

*Tuning-fork-based apertureless SNOM for visible and infrared studies.*

Y. De Wilde, F. Formanek, L. Aigouy.  
NFO7 - 7th International Conference in Near-Field Optics and Related Techniques,  
University of Rochester (USA), August 2002. (Poster)

*Visible and infrared near-field optical microscopy based on a quartz tuning fork.*

Y. De Wilde, F. Formanek, L. Aigouy.  
JMC8 - 8th Days of Condensed Matter, Marseille (France), August 2002. (Poster)

*Imaging subwavelength holes using an apertureless NSOM.*

F. Formanek, Y. De Wilde.  
JMC8 - 8th Days of Condensed Matter, Marseille (France), August 2002. (Poster)

*Applications in the visible and in the infrared of near-field optical microscopy.*

F. Formanek, Y. De Wilde, L. Aigouy.  
Nanotechnology Day 2003, French Ministry of Research and New Technologies, Paris (France),  
January 2003. (Poster)

*Apertureless near-field optical microscopy with or without laser source.*

Y. De Wilde, F. Formanek, L. Aigouy.  
2003 FORUM on local probes microscopy, La Grande-Motte (France), March 2003. (Oral)

*Nanometer-scale probing of optical and thermal near-fields with an apertureless NSOM.*

F. Formanek, Y. De Wilde, L. Aigouy, W.K. Kwok, L. Paulius, Y. Chen.  
Microscale Heat Transfer 2, Eurotherm 75, Reims (France), July 2003. (Oral)

*Scattering probes: from near-field to 3-D imaging.*

G. Moneron, A. Fragola, F. Formanek, L. Willame, A. Dubois, L. Aigouy, Y. De Wilde, S. Gresillon,  
C. Boccara.  
The International Nanophotonics Symposium Handai, Osaka University (Japan), July 2003. (Oral)

*Apertureless NSOM working with or without laser source.*

F. Formanek, Y. De Wilde, L. Aigouy, Y. Chen.  
APNFO4 - 4th Asia-Pacific International Conference on Near-Field Optics, Taroko (Taiwan),  
October 2003. (Oral)

*Infrared near-field optical microscopy with or without illumination.*

F. Formanek, Y. De Wilde, L. Aigouy.

JMC9 - 9th Days of Condensed Matter, Nancy (France), July 2004. (Oral)

*Apertureless near-field microscope operating in dual optical and thermo-optical mode.*

Y. De Wilde, F. Formanek, L. Aigouy.

NFO8 - 8th International Conference in Near-Field Optics and Related Techniques, Seoul (Korea), September 2005. (Oral)

*Site selective metal coating of three-dimensional structures fabricated by two-photon absorption.*

K. Chiyoda, T. Tanaka, N. Takeyasu, F. Formanek, A. Ishikawa, S. Kawata.

66th Autumn Meeting of the Japan Society of Applied Physics, Tokushima (Japan), September 2005. (Oral)

*Fabrication of 3D metallic nano/microstructures by two-photon polymerization for metamaterials.*

F. Formanek.

Workshop on Nano-Optics, Department of Physics, National Taiwan University, Taipei (Taiwan), February 2006. (Invited talk)

*Apertureless near-field scanning optical microscopy with or without laser illumination: towards the infrared scanning tunneling microscope.*

P.-A. Lemoine, F. Formanek, Y. De Wilde, R. Carminati, B. Gralak, K. Joulain, J.-P. Mulet, Y. Chen, J.-J. Greffet.

The Sixth France-Japan Workshop on Nanomaterials, Sapporo (Japan), March 2006. (Oral)

*3D fabrication of metallic nanostructures by two-photon polymerization.*

F. Formanek, N. Takeyasu, K. Chiyoda, T. Tanaka, A. Ishikawa, S. Kawata.

53rd Spring Meeting of the Japan Society of Applied Physics, Tokyo (Japan), March 2006. (Oral)

*Localized metal coating of three-dimensional polymer microstructures.*

N. Takeyasu, F. Formanek, K. Chiyoda, T. Tanaka, A. Ishikawa, S. Kawata.

53rd Spring Meeting of the Japan Society of Applied Physics, Tokyo (Japan), March 2006. (Oral)

*Site-selective metal coating of three-dimensional polymer structures for metamaterial.*

K. Chiyoda, T. Tanaka, N. Takeyasu, F. Formanek, A. Ishikawa, S. Kawata.

53rd Spring Meeting of the Japan Society of Applied Physics, Tokyo (Japan), March 2006. (Oral)

*Three-dimensional fabrication of metallic micro/nanostructures by two-photon polymerization for metamaterials.*

F. Formanek, N. Takeyasu, T. Tanaka, K. Chiyoda, A. Ishikawa, S. Kawata.

SPIE Optics & Photonics, San Diego (USA), August 2006. (Oral)

*Site-selective metal deposition on 3D micro/nanostructures fabricated by two-photon polymerization.*

N. Takeyasu, F. Formanek, K. Chiyoda, T. Tanaka, A. Ishikawa, S. Kawata.

SPIE Optics & Photonics, San Diego (USA), August 2006. (Oral)

*Detection of near-field thermal radiation: the infrared scanning tunneling microscope.*

Y. De Wilde, F. Formanek, R. Carminati, B. Gralak, K. Joulain, J.-P. Mulet, Y. Chen, P.-A. Lemoine, J.-J. Greffet.

NFO9 - 9th International Conference in Near-Field Optics and Related Techniques, Lausanne (Switzerland), September 2006. (Oral)

*Site-selective metal deposition on polymer microstructures for metal/polymer composite materials.*

N. Takeyasu, F. Formanek, T. Tanaka, A. Ishikawa, S. Kawata.

American Chemical Society 232nd National Meeting, San Francisco (USA), September 2006. (Oral)