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Profile

Senior group leader and honorary professor of physics. Main research areas: liquid-phase electron microscopy of cells and nanomaterials.

Education

Faculty of Biology, Albert-Ludwigs-University Freiburg, Germany— Feb. 1996 - July 1999. PhD in natural sciences, specialization biophysics.

Department of Physics and Astronomy, University of Amsterdam, the Netherlands — Jan. 1989 - Aug. 1994. Master's in experimental physics, specialization in nuclear physics. (University of Leiden, the Netherlands, physics — Aug. - Dec. 1988)

Academic Appointments

Honorary professor of experimental physics, Department of Physics and Mechatronics Engineering, Saarland University, Saarbrücken, Germany — Sept. 2013 - present. (honorary prof. has half the teaching load of a full prof.)

Adjoint assistant professor of biophysics, VUMC — March. 2012 - Feb. 2015.

Assistant professor of biophysics, Department of Molecular Physiology and Biophysics, Vanderbilt University School of Medicine, Nashville, TN, USA (VUMC) — July 2007 - Dec. 2011.

Adjunct assistant professor of physics, Faculty of Physics and Astronomy, University of Tennessee, Knoxville, TN, USA (UTK) — Aug. 2006 - Dec. 2008.

Employment

Senior group leader (tenured position), Innovate Electron Microscopy, INM-Leibniz Institute for new Materials, Saarbrücken, Germany — Jan. 2012 - present.

Research staff, strategic hire, Materials Science and Technology Division, Oak Ridge National Laboratory, Oak Ridge, TN, USA (ORNL) — April 2005 - June. 2010.

Senior scientist, project leader, Philips Research, Eindhoven, the Netherlands — Jan. 2000 - March 2005 (scientist in 2000).

Post-doc, Faculty of Biology, Univ. Freiburg, — Aug. - Dec. 1999.

Research

A central scientific challenge of our time is to understand the molecular machinery underlying cellular function. My research program focuses on studying membrane protein function in whole mammalian cells using liquid-phase electron microscopy. Specific topics are growth factor receptors in breast cancer cells, and the stoichiometry of calcium channels. Secondly, we study processes involving nanomaterials at the solid-liquid interface. I have pioneered the technology of liquid-phase scanning transmission electron microscopy (STEM). Additional research involves innovations in three-dimensional-, and time-resolved STEM. My group based in experimental physics and biophysics is interdisciplinary and includes also scientists with backgrounds in human/cell biology, chemistry, and image processing. I am responsible for a microscopy facility including aberration corrected STEM (ARM200, JEOL), environmental scanning electron microscopy (ESEM, Quanta, FEI), and fluorescence microscopy.

Selected professional activities

Chair of the first Gordon Research Conference on liquid-phase electron microscopy, Tuscany, Italy, Jan. 26 - 31, 2020.

Member of the MRS Innovation in Materials Characterization Award subcommittee (2018-).

Member of the editorial board of Ultramicroscopy, 2018 - present.

Leading organizer of the bi-annual "Conference on In Situ and Correlative Electron Microscopy (CISCeM)", INM, Saarbrücken, Germany, Oct 10-12, 2018; Oct 11-12, 2016; Oct 14-15, 2014; Nov. 6-7, 2012.

Abellan, P. & de Jonge, N., guest editors, special issue on electron microscopy in liquid, *Micron*, 2018.

Co-organizer of the symposium "*In situ* transmission electron microscopy in liquid and gas cells" at the Microscopy and Microanalysis meeting, Baltimore, MD, USA, Aug. 5-9, 2018.

Session chair of the symposium "In-situ and time-resolved microscopy" at the Microscopy Conference 2017, Lausanne, Switzerland, Aug. 21-25, 2017.

Co-organizer of the symposium IM2 "Micro-Nano Lab and dynamic microscopy" at the European Microscopy Congress, Lyon, France, Aug. 28 - Sept. 2, 2016.

Organizer of the symposium "Advances in 3D Electron Microscopy" at the Microscopy and Microanalysis meeting, Nashville, TN, USA, Aug. 7-11, 2011.

Co-organizer of the symposium "Transmission EM and Spectroscopy at or near realistic conditions" at the Microscopy and Microanalysis meeting, Portland, OR, USA, Aug. 1-5, 2010.

Co-organizer of the symposium "*In situ* Microscopy and Spectroscopy" at the MRS 2010 spring meeting, San Francisco, CA, USA, April 5-9, 2010.

Member of the editorial board of *Microscopy and Microanalysis*, June 2010 - present.

Honors

Honoris Causa, National Institute of Applied Sciences (INSA), University of Lyon, France, Dec. 7, 2017.

Quadrennial Life Sciences award of the European Microscopy Society 2016.

MRS Innovation in Materials Characterization Award 2016 together with Frances Ross (IBM T. J. Watson Research Center) and Chongmin Wang (Pacific Northwest National Laboratory).

Paper selected as Top 2011 Article, *Scanning* 33, 135-146; Best Instrumentation or Techniques Development Paper 2011, *Microscopy and Microanalysis* 17, 817-826;

Esprit de Corps, community service category award, ORNL, Nov. 14, 2008; Innovation Award, ORNL, March 1, 2007.

Publications

h-index = 38 (Google Scholar), 30 (ResearcherID)

A. Papers in Peer Reviewed Journals

Key papers as corresponding author are indicated

Review Papers

8. de Jonge, N., Houben, L., Dunin-Borkowski, R.E. & Ross, F.M., Resolution and aberration correction in liquid cell transmission electron microscopy. *Nat. Rev. Mat.* 4, 61-78, 2019. **key paper**
7. Ando, T., Bhamidimarri, S.P., Brending, N., Colin-York, H., Collinson, L., de Jonge, N., De Pablo G.P.J., Debroye, E., Eggeling, C., Franck, C., Fritzsche, M., Gerritsen, H., Giepmans, B., Grunewald, K., Hofkens, J., Hoogenboom, J., Janssen, K.P.F., Kaufman, R., Klumperman, J., Kurniawan, N., Kusch, J., Liv, N., Parekh, V., Peckys, D.B., Rehfeldt, F., Reutens, D., Roeffaers, M., Salditt, T., Schaap, I., Schwarz, U., Verkade, P., Vogel, M., Wagner, R., Winterhalter, M., Yuan, H., Zifarelli, G., The 2018 correlative microscopy techniques roadmap, *J. Phys. D.*, 51, 443001-1-42 (2018).
6. Textor, M. & de Jonge, N., Strategies for preparing graphene liquid cells for transmission electron microscopy. *Nano Lett.* 18, 3313-3321, 2018.
5. de Jonge, N., Wang, C. & Ross, F.M., Transmission electron microscopy of specimens and processes in liquid. *MRS Bulletin* 41, 791-799, 2016.
4. Dahmen, T., Trampert, P., de Jonge, N. & Slusallek, P., Advanced Recording Schemes for Electron Tomography. *MRS Bulletin* 41, 537-541, 2016.
3. de Jonge, N. & Ross, F.M., Electron microscopy of specimens in liquid. *Nature Nanotechnology* 6, 695-704, 2011. **key paper**
2. Milne, W.I., Teo, K.B.K., Mann, M., Bu, I.Y.Y., Amaratunga, G.A.J., de Jonge, N., Allieux, M., Oostveen, J.T., Legagneux, P., Minoux, E., Gangloff, L., Hudanski, L., Schnell, J.P., Dieumegard, L.D., Peauger, F., Wells, T. & El-Gomati, M., Carbon nanotubes as electron sources. *Phys. Stat. Sol.* 203, 1058-1063, 2006.
1. de Jonge, N. & Bonard, J. M., Carbon nanotube electron sources and applications. *Phil. Trans. R. Soc. Lond. A* 362, 2239-2266, 2004. **key paper**

Original Manuscripts

80. Cepeda-Pérez, E. & de Jonge, N., Dynamics of gold nanoparticle clusters observed with liquid-phase electron microscopy. *Micron* 117, 68-75, 2019.
79. Hahn, G., Kunas, P., de Jonge, N. & Kempe, R., General synthesis of primary amines via reductive amination employing a reusable nickel catalyst. 2, 71-77, 2019, 2018.
78. Keskin, S. & de Jonge, N. Reduced radiation damage in transmission electron microscopy of proteins in graphene liquid cells, *Nano Lett.* 18, 7435-7440, 2018. **key paper**
77. Bachmaier, A., Rathmayr, G.B., Schmauch, J., Schell, n., Stark, A., de Jonge, N. & Pippan, R., High strength nanocrystalline Cu-Co alloys with high tensile ductility. *J. Mater. Res.*, early online, 2018.
76. Parker, K., Trampert, P., Tinnemann, V., Peckys, D.B., Dahmen, T. & de Jonge, N., Linear chains of HER2 receptors found in the plasma membrane using liquid-phase electron microscopy. *Biophys. J.* 115, 503-513, 2018.
75. de Jonge, N., Theory of the spatial resolution of (scanning) transmission electron microscopy in liquid water or ice layers. *Ultramicroscopy* 187, 113-125, 2018.
74. de Jonge, N., Verch, A. & Demers, H., The influence of beam broadening on the spatial resolution of annular dark field scanning transmission electron microscopy. *Microsc. Microanal.* 24, 8-16, 2018.

73. Uder, B., Gao, H., Kunas, P., de Jonge, N. & Hartmann, U., Low-force spectroscopy on graphene membranes by scanning tunneling microscopy. *Nanoscale*, *Nanoscale* 10, 2148-2153, 2018.
72. Tilgner, D., Friedrich, M., Verch, A., de Jonge, N. & Kempe, R., A Metal-organic framework-based nonprecious metal photocatalyst for visible light-driven wastewater treatment. *Chem. Photo. Chem.*, early online, 2018.
71. de Jonge, N., Membrane protein stoichiometry studied in intact mammalian cells using liquid-phase electron microscopy. *J. Microsc.* 269, 134-142, 2018.
70. Dahmke, I. N., Verch, A., Hermannsdörfer, J., Peckys, D.B., Weatherup, R., Hofmann, S. & de Jonge, N., Graphene liquid-enclosure for single-molecule analysis of membrane proteins in whole cells using electron microscopy. *ACS Nano* 11, 11108-11117, 2017. **key paper**
69. Vanhecke, D., Kuhn, D.A., Jimenez de Aberasturi, D., Balog, S., Milosevic, A., Urban, D., Peckys, D.B., de Jonge, N., Parak, W.J., Petri-Fink, A. & Rothen-Rutishauser, B., Involvement of two uptake mechanisms of gold and iron oxide nanoparticles in a co-exposure scenario using mouse macrophages. *Beilstein J. Nanotechnology*. 8, 2396–2409, 2017, 2017.
68. Peckys, D.B., Korf, U., Wiemann, S. & de Jonge, N., Liquid-phase electron microscopy of molecular drug response in breast cancer cells reveals irresponsive cell subpopulations related to lack of HER2 homodimers. *Mol. Biol. Cell* 28, 3193-3202, 2017, 2017. **key paper**
67. Peckys, D.B., Stoerger, C., Lattab, L., Wissenbach, U., Flockerzi, V. & de Jonge, N., The stoichiometry of the TMEM16A ion channel determined in intact plasma membranes of COS-7 cells using liquid-phase electron microscopy. *J. Struct. Biol.* 199, 102-113, 2017.
66. Hermannsdörfer, J. & de Jonge, N., Studying Dynamic Processes of Nano Sized Objects in Liquid using Electron Microscopy. *JoVE* 120, e54943, 2017.
65. Zečević, J., Hermannsdörfer, J., Schuh, T., de Jong, K. & de Jonge, N., Reshaping and resizing silica nanoparticles with liquid-phase transmission electron microscopy. *Small* 13, 1602466-1-8, 2017.
64. de Jonge, N. & Peckys, D.B., Live cell electron microscopy is probably impossible. *ACS Nano* 10, 9061-9063, 2016.
63. Peckys, D.B., Alansary, D., Niemeyer, B.A. & de Jonge, N., Visualizing quantum dot labeled ORAI1 proteins in intact cells via correlative light- and electron microscopy. *Microsc. Microanal.* 22, 902-912, 2016.
62. Hermannsdörfer, J., Tinnemann, V., Peckys, D.B. & de Jonge, N., The effect of electron beam irradiation in environmental scanning transmission electron microscopy of whole cells in liquid. *Microsc. Microanal.* 22, 656-665, 2016.
61. Dahmen, T., Engstler, M., Pauly, C., Trampert, P., de Jonge, N., Mücklich, F. & Slusallek, P., Feature adaptive sampling for scanning electron microscopy. *Sci. Rep.* 6, 25350-1-11, 2016.
60. Hermannsdörfer J., de Jonge, N. & Verch, A., Electron beam induced chemistry of gold nanoparticles in saline solution. *Chem. Comm.* 51, 16393-16396, 2015.
59. Casavola, M., Hermannsdörfer, J., de Jonge, N., Dugulan, J. & de Jong, K.P., Fabrication of Fischer-Tropsch catalysts by deposition of iron nanocrystals on carbon nanotubes. *Adv. Funct. Mater.* 25, 5309-5319, 2015.
58. Verch, A., Pfaff, M. & de Jonge, N., Exceptionally slow movement of gold nanoparticles at a solid:liquid interface investigated by scanning transmission electron microscopy. *Langmuir* 31, 6956–6964, 2015.
57. Peckys, D.B., Korf, U. & de Jonge, N., Local variations of HER2 dimerization in breast cancer cells discovered by correlative fluorescence- and liquid electron microscopy. *Science Advances* 1:e1500165, 2015. **key paper**

56. Peckys, D.B. & de Jonge, N., Studying the stoichiometry of epidermal growth factor receptor in intact cells using correlative microscopy. *JoVE*, e53186, 2015.
55. Dahmen, T., Kohr, H., de Jonge, N. & Slusallek, P., Matched backprojection operator for combined scanning transmission electron microscopy tilt- and focal series. *Microsc. Microanal.* 21, 725-728, 2015.
54. van de Put, M.W.P., Carcouët, C.C.M.C., Bomans, P.H.H., Friedrich, H., de Jonge, N. & Sommerdijk, N.A.J.M., Writing silica structures in liquid with scanning transmission electron microscopy. *Small* 11, 585-590, 2015.
53. Barrirero, J., Engstler, M., Ghafoor, N., de Jonge, N., Odén, M. & Mücklich, F., Comparison of segregations formed in unmodified and Sr-modified Al-Si alloys studied by atom probe tomography and transmission electron microscopy. *Journal of Alloys and Compound, J. Alloys Compd.* 611, 410-421, 2014.
52. Dahmen, T., Baudoin, J.P., Lupini, A.R., Kübel, C., Slusallek, P. & de Jonge, N., Combined Scanning Transmission Electron Microscopy Tilt- and Focal Series. *Microsc. Microanal.* 20, 548-560, 2014.
51. Peckys, D.B. & de Jonge, N., Liquid scanning transmission electron microscopy: imaging protein complexes in their native environment in whole eukaryotic cells. *Microsc. Microanal.* 20, 346-365, 2014. In: special issue on electron microscopy of specimens in liquid. Ed. de Jonge, N.
50. Schuh, T. & de Jonge, N., Liquid scanning transmission electron microscopy: nanoscale imaging in micrometers-thick liquids. *C. R. Physique* 15, 214-223, 2014.
49. Peckys, D.B. & de Jonge, N., Gold nanoparticle uptake in whole cells in liquid examined by environmental scanning electron microscopy. *Microsc. Microanal.* 20, 189-198, 2014.
48. Peckys, D.B., Baudoin, J.P., Eder, M., Werner, U. & de Jonge, N., Epidermal growth factor receptor subunit locations determined in hydrated cells with environmental scanning electron microscopy. *Scientific Reports* 3, 2626-1-6, 2013. **key paper**
47. Kraus, T. & de Jonge, N., Dendritic gold nanowire growth observed in liquid with transmission electron microscopy. *Langmuir* 29, 8427-8432, 2013.
46. Baudoin, J.P., Jinschek, J.R., Boothroyd, C.B., Dunin-Borkowski, R.E. & de Jonge, N., Chromatic aberration corrected tilt series transmission electron microscopy of a whole mount macrophage cell. *Microsc. Microanal.* 19, 814-820, 2013.
45. Ramachandra, R., Demers, H. & de Jonge, N., The effect of the sample thickness on the lateral- and axial resolution of aberration-corrected scanning transmission electron microscopy. *Microsc. Microanal.* 19, 93-101, 2013.
44. Baudoin, J.P., Jerome, W.G., Kuebel, C. & de Jonge, N., Whole-cell analysis of low-density lipoprotein uptake by macrophages using STEM tomography. *Plos One* 8, e55022-1-8, 2013.
43. Demers, H., Poirier-Demers, N., Phillips, M., de Jonge, N. & Drouin, D., Three-dimensional electron energy deposition modeling of cathodoluminescence emission near threading dislocations in GaN and electron-beam lithography exposure parameters for a PMMA resist. *Microsc. Microanal.* 18, 1220-1228, 2012.
42. Demers, H., Ramachandra, R., Drouin, D. & de Jonge, N., The probe profile and lateral resolution of scanning transmission electron microscopy of thick specimens. *Microsc. Microanal.* 18, 582-590, 2012.
41. Ring, E.A. & de Jonge, N., Video-frequency scanning transmission electron microscopy of moving gold nanoparticles in liquid. *Micron* 43, 1078-1084, 2012.
40. Heeres, E.C., Oosterkamp, T.H. & de Jonge, N., The size of the localized electron emission sites on a closed multi-walled carbon nanotube. *Phys. Rev. Lett.* 108, 36804-1-5, 2012.
39. Ramachandra, R. & de Jonge, N., Optimized deconvolution for maximum axial resolution in three-dimensional aberration-corrected scanning transmission electron microscopy. *Microsc. Microanal.* 18, 218-228, 2012.

38. Demers, H., Poirier-Demers, H., Couture, A.R., Joly, D., Guilmain, M., de Jonge, N. & Drouin, D., Three-dimensional electron microscopy simulation with the CASINO Monte Carlo software. *Scanning* 33, 135-146, 2011.
37. Lupini, A.R. & de Jonge, N., The three-dimensional point spread function of aberration-corrected scanning transmission electron microscopy. *Microsc. Microanal.* 17, 817-826, 2011.
36. Ring, E.A., Peckys, D.B., Dukes, M.J., Baudoin, J.P. & de Jonge, N., Silicon nitride windows for electron microscopy of whole cells. *J. Microscopy* 243, 273-283, 2011.
35. Peckys, D.B., Mazur, P., Gould, K.L. & de Jonge, N., Fully hydrated yeast cells imaged with electron microscopy. *Biophys. J.* 100, 2522-2529, 2011.
34. Dukes, M.J., R. Ramachandra, J.P. Baudoin, W.G. Jerome & de Jonge, N., Three-dimensional locations of gold-labeled proteins in a whole mount eukaryotic cell obtained with 3 nm precision using aberration-corrected scanning transmission electron microscopy. *J. Struct. Biol.* 174, 552-562, 2011.
33. Heeres, E.C., Oosterkamp, T.H. & de Jonge, N., Making carbon nanotube electron sources of defined lengths and with closed caps. *Nanotechnology* 22, 235308-1-8, 2011.
32. Peckys, D.B. & de Jonge, N., Visualization of gold nanoparticle uptake in living cells with liquid scanning transmission electron microscopy. *Nano Lett.* 11, 1733-1738, 2011. **key paper**
31. Ramachandra, R., Demers, H. & de Jonge, N., Atomic resolution through silicon nitride membranes. *Appl. Phys. Lett.* 98, 93109-1-3, 2011.
30. Klein, K.L., Anderson, I.M. & de Jonge, N. Transmission electron microscopy with a liquid flow cel. *J. Microscopy* 242, 117-123, 2011.
29. Jarvis, J.D., Andrews, H.L., Ivanov, B., Stewart, C.L., de Jonge, N., Heeres, E.C., Kang, W.P., Wong, Y.M., Davidson, J.L. & Brau, C.A., Resonant tunneling and extreme brightness from diamond field emitters and carbon nanotubes. *J. Appl. Phys.* 108, 94322-1-6, 2010.
28. Demers, H., Poirier-Demers, N., Drouin, D. & de Jonge, N., Simulating STEM imaging of nanoparticles in micrometers-thick substrates. *Microsc. Microanal.* 16, 795-804, 2010.
27. Dukes, M.J., Peckys, D.B. & de Jonge, N., Correlative fluorescence microscopy and liquid STEM of proteins labeled with quantum dots on intact cells. *ACS Nano* 4, 4110-4116, 2010. **key paper**
26. Ring, E.A. & de Jonge, N., Microfluidic system for transmission electron microscopy. *Microsc. Microanal.* 16, 622-629, 2010.
25. de Jonge, N., Poirier-Demers, N., Demers, H., Peckys, D.B. & Drouin, D., Nanometer-resolution electron microscopy through micrometers-thick water layers. *Ultramicroscopy* 110, 1114-1119, 2010.
24. de Jonge, N., Bigelow, W.C. & Veith, G.M., Atmospheric pressure scanning transmission electron microscopy. *Nano Lett.* 10, 1028, 2010.
23. de Jonge, N., Sougrat, R., Northan, B. & Pennycook, S.J., Three-dimensional scanning transmission electron microscopy for biological specimen. *Microsc. Microanal.* 16, 54-63, 2010.
22. Peckys, D.B., Veith, G.M., Joy, D.C. & de Jonge, N., Nanoscale imaging of whole cells using a liquid enclosure and a scanning transmission electron microscope. *PLoS One* 4, e8214-1-7, 2009.
21. de Jonge, N., Peckys, D.B., Kremers, G.J. & Piston, D.W., Electron microscopy of whole cells in liquid with nanometer resolution. *Proc. Natl. Acad. Sci.* 106, 2159-2164, 2009. **key paper**
20. Peckys, D.B., de Jonge, N., Simpson, M.L. & McKnight, T.E., End-specific strategies of attachment of long double stranded DNA onto gold-coated nanofiber arrays. *Nanotechnology* 19, 435301, 2008.
19. Edgcombe, C. J. & de Jonge, N., Deduction of work function of carbon nanotube field emitter by use of curved-surface theory. *J. Phys. D: Appl. Phys.* 40, 4123-4128, 2007.

18. Heeres, E.C., Bakkers, E.P.A.M., Roest, A.L., Kaiser, M., Oosterkamp, T.H. & de Jonge, N., Electron emission from individual indium arsenide semiconductor nanowires. *Nano Lett.* 72, 536-540, 2007.
17. Kaiser, M., Doytcheva, M., Verheijen, M.A. & de Jonge, N., In-situ transmission electron microscopy of individual free-standing carbon nanotubes. *Ultramicroscopy* 106, 902-908, 2006.
16. Doytcheva, M., Kaiser & de Jonge, N., In-situ transmission electron microscopy investigation of the structural changes in carbon nanotubes during electron emission at high currents. *Nanotechnology* 17, 3226-3233, 2006.
15. Edgcombe, C. J. & de Jonge, N., Properties of a field emitter deduced from curvature of its Fowler-Nordheim plot. *J. Vac. Sci. Technol B* 24, 869-873, 2006.
14. de Jonge, N., Allioux, M., Oostveen, J.T., Teo, K. B. K & Milne, W. I, Low noise and stable emission from carbon nanotube electron sources. *Appl. Phys. Lett.* 87, 133118-1-3, 2005.
13. de Jonge, N., Allioux, M., Oostveen, J.T., Teo, K. B. K & Milne, W. I, The optical performance of carbon nanotube electron sources. *Phys. Rev. Lett.* 94, 186807-1-4, 2005. **key paper**
12. de Jonge, N., Doytcheva, M., Allioux, M., Kaiser, M., Mentink, S.A.M., Teo, K. B. K, Lacerda, R. G. & Milne, W. I, Cap closing of thin carbon nanotubes. *Adv. Mater.* 17, 451-455, 2005.
11. Doytcheva, M., Kaiser, M., Verheijen, M. A., Reyes-Reyes, M., Terrones, M. & de Jonge, N., Electron emission from individual nitrogen-doped multi-walled carbon nanotubes. *Chem. Phys. Lett.* 396, 126-130, 2004.
10. De Jonge, N. Allioux, M., Doytcheva, M., Kaiser, M., Teo, K. B. K, Lacerda, R. G. & Milne, W. I, Characterization of the field emission properties of individual thin carbon nanotubes, *Appl. Phys. Lett.* 85, 1607-1609, 2004.
9. de Jonge, N., The brightness of carbon nanotube electron emitters. *J. Appl. Phys.* 95, 673-681, 2004.
8. de Jonge, N., Lamy, Y. & Kaiser, M., Controlled mounting of individual multi-walled carbon nanotubes on support tips. *Nano Lett.* 3, 1621-1624, 2003.
7. de Jonge, N. & van Druten, N. J., Field emission from individual multiwalled carbon nanotubes prepared in an electron microscope. *Ultramicroscopy* 95, 85-91, 2003.
6. de Jonge, N., Lamy, Y., Schoots, K. & Oosterkamp, T. H., High brightness electron beam from a multi-walled carbon nanotube. *Nature* 420, 393-395, 2002. **key paper**
5. Rau, H. K., de Jonge, N. & Haehnel, W., Combinatorial synthesis of four-helix bundle hemoproteins for tuning cofactor properties. *Angew. Chem. Int. Ed.* 39, 250-253, 2000.
4. de Jonge, N., Rau, H. K. & Haehnel, W., Light induced electron transfer in synthetic metalloproteins. *Z. Phys. Chem.* 213, 175-180, 1999.
3. Rau, H. K., de Jonge, N. & Haehnel, W., Modular synthesis of de novo-designed metalloproteins for light-induced electron transfer. *Proc. Natl. Acad. Sci.* 95, 11526-11531, 1998.
2. van den Brink, H. B. et al., Neutral-pion electroproduction on the proton near threshold. *Phys. Rev. Lett.* 74, 3561-3564, 1995.
1. Bobeldijk, I. et al., High-momentum protons in ²⁰⁸Pb. *Phys. Rev. Lett.* 73, 2684-2687, 1994.

Other Scientific Publications

11. de Jonge, N., Mølhave, K. & Alloyeau, D., Introduction to the proceedings of CISCEM2018 - the 4th conference on in-situ and correlative electron microscopy. *Microsc. Microanal.* 25S1, 1-2, 2019.
10. Abellan, P. & de Jonge, N., Preface to the special issue on liquid-phase electron microscopy. *Micron* 119, 117-118, 2019.

9. de Jonge, N., Corrigendum to: "theory of the spatial resolution of (scanning) transmission electron microscopy in liquid water or ice layers" [Ultramicroscopy 187 (2018) 113–125]. Ultramicroscopy 196,129-130, 2019.
8. de Jonge, N., Mølhave, K. & Alloyeau, D., Conference on In-Situ and Correlative Electron Microscopy (CISCEM 2016). Microsc. Microanal. 22(S5), 1-3, 2016.
7. de Jonge, N., Ross, F., & Wang, C., De Jonge, Ross, and Wang to receive MRS Innovations in Materials Characterization Award. MRS Bulletin 41, 242-243, 2016.
6. Peckys, D.B., Baudoin, J.P., Eder, M., Werner, U. & de Jonge, N., Corrigendum: Epidermal growth factor receptor subunit locations determined in hydrated cells with environmental scanning electron microscopy. Sci. Rep. 5, 12661, 2015.
5. de Jonge, N., Introduction to special issue on electron microscopy of specimens in liquid. Microsc. Microanal. 20, 315-316, 2014.
4. ed., Ferrari, A.C., Hartschuh, A. & de Jonge, N., Science and Technology of Nanotubes and Nanowires. Physica E: Low-dimensional Systems and Nanostructures 37, 1-298, 2007.
3. de Jonge, N., Allieux, M., Doytcheva, M., Kaiser, M., Teo, K.B.K., Lacerda, R.G. & Milne, W.I. , Field emission from individual thin carbon nanotubes, AIP Conference Proceedings N723, 485-489, 2004.
2. de Jonge, N., Lamy, Y., Schoots, K. & Oosterkamp, T. H., Corrigendum: High brightness electron beam from a multi-walled carbon nanotube. Nature 423, 461, 2003.
1. Kurt, R. & de Jonge, N., The nanotube site. Angew. Chem. Int. Ed. 41, 999, 2002. Extended Abstracts in Peer Reviewed Journals
52. Dahmke, I. N., Verch, A., Peckys, D.B., Weatherup, R., Hofmann, S. & de Jonge, N., Correlative fluorescence and electron microscopy of graphene-enclosed whole cells for high resolution analysis of cellular proteins. Microsc. Microanal. 25S1, 5-6, 2019.
51. Kunnas, P., Rzadkiewicz, S., Moradi, M., Patterson, J., Sommerdijk, N.A.J.M. & de Jonge, N., Challenges in observing the formation of colloidal, self-assembled monolayer with in situ electron microscopy in Liquid. Microsc. Microanal. 25S1, 55-56, 2019.
50. Keskin, S. & de Jonge, N., Imaging graphene-encapsulated microtubules at room temperature with electron microscopy. Microsc. Microanal. 25S1, 11-12, 2019.
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