

Hybrid Nanosystems, W. Albrecht (2017-2022)

Biography



Wiebke Albrecht was born on December 13, 1986 in Berlin, Germany. She obtained her PhD in the Soft Condensed Matter group headed by Prof. Alfons van Blaaderen at Utrecht University in 2017. From 2017-2021 she was a postdoctoral researcher at the Electron Microscopy for Materials Science group at the University of Antwerp and partially at the Single-Molecule Optics group of Prof. Michel Orrit at Leiden University. Since May 2021 she is the group leader of the Hybrid Nanosystems group at AMOLF. During her postdoctoral time she was awarded with a Marie Skłodowska-Curie Individual Fellowship and received the Minerva prize in 2021.

With her group she investigates structure-property correlations at the single nanoparticle level and the interaction between different components in complex hybrid nanostructures while targeting sustainable energy applications. In particular, her research focuses on unravelling the interplay of nanoscale morphology and properties in such nanosystems by combining advanced electron microscopy and single particle optical and time-resolved spectroscopy. Simultaneously, her research includes new approaches to obtain valuable information on the single nanoparticle level through spectroscopic tools either fully optically with the help of machine learning or in the electron microscope. In addition, the current group's research directly links to applications in sustainable chemistry such as plasmonics for light-driven catalytic reactors.

Group output

Peer reviewed Publications 2017-2022 (with AMOLF affiliation)

2022

1. G. González-Rubio and W. Albrecht, Engineering of plasmonic gold nanocrystals through pulsed laser irradiation, *Appl. Phys. Lett.* **121**, (20), 200502: 1-14 (2022) Green OA
2. P. Spaeth, S. Adhikari, W. Heyvaert, X. Zhuo, I. Garcia, L.M. Liz-Marzán, S. Bals, M. Orrit and W. Albrecht, Photothermal Circular Dichroism Measurements of Single Chiral Gold Nanoparticles Correlated with Electron Tomography, *ACS Photonics* **9**, 3995-4004 (2022) Hybrid OA
3. Y. Wang, Z. Sztranyovszky, A. Zilli, W. Albrecht, S. Bals, P. Borri and W. Langbein, Quantitatively linking morphology and optical response of individual silver nanohedra, *Nanoscale* **14**, (30), 11028-11037 (2022) Hybrid OA
4. M. Dieperink, F. Scalerandi and W. Albrecht, Correlating structure, morphology and properties of metal nanoparticles by combining single-particle optical spectroscopy and electron microscopy, *Nanoscale* **14**, 7460-7472 (2022) Hybrid OA
5. W. Heyvaert, A. Pedraza-Tardajos, A. Kadu, N. Claes, G. González-Rubio, L.M. Liz-Marzán, W. Albrecht and S. Bals, Quantification of the Helical Morphology of Chiral Gold Nanorods, *ACS Materials Lett.* **4**, (4), 642-649 (2022) Hybrid OA

Contributions to scientific books (chapters or entire book) 2017-2022

N/A

PhD theses 2017-2022

N/A

Masters and Bachelors theses 2017-2022

1. Tjom Arens, *Monitoring and Engineering the Light-to-heat Conversion around Plasmonic Gold Nanoparticles using Ratiometric Nanothermometry*, Master's Minor Project Thesis, co-supervised with Dr. Freddy Rabouw, Debye Institute for Nanomaterials Science, Utrecht University, April 2022
2. Wouter Heyvaert, *Een kwantitatieve methode voor de analyse van de helische morfologie van nanostructuren op basis van elektronentomografie*, Master's Thesis, co-supervised with Prof. Sara Bals, University of Antwerp, May 2022

Invited lectures at international conferences and meetings

2021

1. EUSMI final meeting in Frankfurt, Germany (November 2021): *Correlation of optical properties and 3D morphological features on single nanoparticles*
2. DENSsolutions webinar online (May 2021): *Diffusion in single nanoparticles measured in situ using electron tomography*
3. EMAT Friday lecture in Antwerp, Belgium (May 2021): *3D structural transformations and structure-property correlation of single nanoparticles*

2022

1. AMOLF international summer school, The Netherlands (June 2022): *Laser modification of nanomaterials*
2. CIMTEC Congress in Perugia, Italy (June 2022, postponed from 2020/2021): *Correlating the 3D Structure of Nanoparticles with Their Optical Properties*

Academic teaching 2017-2022

N/A

Selected awards & recognitions 2017-2022

2021

1. W. Albrecht: Minerva prize awarded by the DPC and NNV.
2. Interview with 'New Scientist' on 100th edition, published on May 18th

2022

N/A

Valorization 2017-2022

1. Research contract with Shell, BASF, ExxonMobil, Toyota, Delmic, DENSSolutions on light-driven chemistry (NWO KIC project): knowledge transfer through workshops
2. Research contract with Delmic, Thermo Fisher Scientific (EBEAM Pathfinder project): knowledge transfer through workshops
3. Research contract with JEOL, Amsterdam Scientific Instruments (NWO-RI SHINE investment project): design and installation of new TEM infrastructure with light injection and electron detection system