



Universiteit
Leiden
The Netherlands

Two-photon luminescence of gold nanorods: applications to single-particle tracking and spectroscopy

Carozza, S.

Citation

Carozza, S. (2017, July 4). *Two-photon luminescence of gold nanorods: applications to single-particle tracking and spectroscopy*. *Casimir PhD Series*. Retrieved from <https://hdl.handle.net/1887/50407>

Version: Not Applicable (or Unknown)

License: [Licence agreement concerning inclusion of doctoral thesis in the Institutional Repository of the University of Leiden](#)

Downloaded from: <https://hdl.handle.net/1887/50407>

Note: To cite this publication please use the final published version (if applicable).

Cover Page



Universiteit Leiden



The handle <http://hdl.handle.net/1887/50407> holds various files of this Leiden University dissertation.

Author: Carozza, S.

Title: Two-photon luminescence of gold nanorods: applications to single-particle tracking and spectroscopy

Issue Date: 2017-07-04

LIST OF PUBLICATIONS

1. "Accuracy of the Detection of Binding Events Using 3D Single-Particle Tracking"
S.Carozza, J. Culkin, J. van Noort
BMC Biophysics 10(3), (2017)
2. "Single-Particle Tracking of Gold Nanorods in Live Cells"
S.Carozza¹, V.I.P. Keizer¹, A. Boyle¹, A. Kros, M. Schaaf, J. van Noort
in preparation
3. "Two-Photon Excitation Spectroscopy of Single Gold Nanorods for Sensing Applications"
S.Carozza¹, R.Vlieg¹, J. van Noort
in preparation

¹ These authors contributed equally to this work

CURRICULUM VITAE

Sara Carozza was born on October 10th, 1987 in Bergamo, Italy. She studied Physics at Università degli Studi di Milano-Bicocca from 2006 to 2011, specializing in Biophysics. She joined the group of Prof. Giuseppe Chirico for both her bachelor's and master's thesis. Her bachelor's thesis was focused on the characterization of gold nanorods and the study of their diffusion using fluorescence correlation spectroscopy. For her master's thesis she studied the emission of a mutant fluorescent protein under varying pH conditions in cellular environment, for pH sensing and imaging applications. In 2012 she joined the group of Dr. ir. John van Noort at Leiden University as a PhD student. In her PhD project she worked on the application of two-photon luminescence of gold nanorods for single-particle imaging and tracking in vitro and in live cells. During her PhD, she was teaching assistant in a bachelor LabVIEW class for 3 years and supervised a master student during his thesis project. She presented her work at several conferences in the Netherlands, Germany and US. Currently, she is working as Data Scientist at Anchormen where she is involved in a project at Friesland Campina.

ACKNOWLEDGEMENTS

I would like to thank John van Noort for trusting me and inviting me to join the Physics of Life Processes group. With his support, knowledge and enthusiasm he guided me through my projects, helping me to see the opportunities beyond the obstacles.

Many thanks to our collaborators Marcel Schaaf, Michel Orrit, Alexander Kros, Peter Zijlstra and Aquiles Carattino for the helpful discussions, interesting insights and new ideas. Without Aimee Boyle's expertise in chemistry and Veer Keizer's in biology, most of this work wouldn't have been possible. Aimee synthesized and functionalized the gold nanorods used for most experiments. Veer prepared and took care of the cells and helped during the imaging experiments and the analysis.

I would like to thank post-doc Jeremie Capoulade, who helped improving the setup and shared with me his deep knowledge of optics. Thanks to master student Jamie Culkin for his hard work on simulations, and to my successor Redmar Vlieg for helping with the acquisition of spectra and of EM images.

The colleagues in the Physics of Life Processes group enriched me as a researcher thanks to their ideas, critical minds and helpfulness. They were great colleagues inside the office, and wonderful friends outside. Thanks to Lena, Wietzke, Meng, Wim, Hedde, Olga, Stefano, Artur, Rolf, Thomas, Kirsten, Babette, Klas, Ruth, Dominique, Maria, Nelli, Joeri, Noemi, Patrick, Kate, Doris, Stefan, and to our neighbors Emrah, Mihela, Marija and Saptaswa. I am grateful to Thomas Schmidt for his assistance and for the precious discussions, and to Sylvie Olthuis and Ineke de Boer for their technical support. A special thanks to Yvonne Kerkhof, who kindly helped me in all the bureaucracy matters.

Thanks to Marco Tompitak and Veer Keizer for the Dutch translation of the summary of this thesis.

Last but not least, I would like to thank my parents and Marco for their endless love and support during this important part of my life.

