

## About the author

Matthias Liebtrau was born on October 11, 1993 in Cologne (Germany) where he grew up and obtained a high-school diploma from Gymnasium Rodenkirchen in 2012. Shortly after, he moved to Bonn to study physics at the University of Bonn. In 2016, he graduated with a Bachelor's thesis about the experimental characterisation of a charged particle detector, sparking his passion for electronic instrumentation. Afterwards, he continued his studies in Bonn with a Master's program in experimental physics, a part of which he spent abroad at Uppsala University in Sweden. The courses he attended in Uppsala raised his interest in the field of optics and nanophotonics. This inspired him to dedicate his Master's thesis to studying the propagation of light in nanoscale plasmonic slot waveguides using interferometric scanning near-field optical microscopy (SNOM).

After graduating from the University of Bonn in 2018, he moved to Amsterdam to join the group of prof. dr. A. Polman at NWO-Institute AMOLF as a Ph.D. student. His research focused on the experimental study of the interaction between free electrons, light, and matter using cathodoluminescence (CL) spectroscopy and photon-induced near-field electron microscopy (PINEM). The results of his work are shown in this thesis. In his free time, he enjoys riding bikes and travelling on the tandem with his girlfriend, hiking, cooking, playing the guitar, and spending time with friends. Furthermore, he is very much interested in aviation and holds a private pilot licence for glider planes since 2010.

