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Nota di contenuto	Introduction to Plasmonics, Templated Electrochemical Synthesis, and On-Wire Lithography -- 1D Nanowire Synthesis: Extending the OWL Toolbox with Semiconductors to Explore Plasmon-Exciton Interactions in the Form of Long-Range Optical Nanoscale Rulers -- Hybrid Semiconductor Core-Shell Nanowires with Tunable Plasmonic Nanoantennas -- 2D Nanowire Synthesis: Invention of Coaxial Lithography -- Solution Dispersible Metal Nanorings: Independent Control of Architectural Parameters and Materials Generality -- Conclusions and Outlook on Templated Electrochemical Synthesis Using Coaxial Lithography.
Sommario/riassunto	This thesis focuses on the electrochemical synthesis of multi-segmented nanowires. In contrast to previous work, which was largely limited to one-dimensional modifications, Tuncay Ozel presents a technique, termed coaxial Lithography (COAL), which allows for the synthesis of coaxial nanowires in a parallel fashion with sub-10 nanometer resolution in both the axial and radial dimensions. This work has significantly expanded current synthetic capabilities with

respect to materials generality and the ability to tailor two-dimensional growth in the formation of core-shell structures. These developments have enabled fundamental and applied studies which were not previously possible. The COAL technique will increase the capabilities of many researchers who are interested in studying light-matter interactions, nanoparticle assembly, solution-dispersible nanoparticles and labels, semiconductor device physics and nanowire biomimetic probe preparation. The methodology and results presented in this thesis appeal to researchers in nanomaterial synthesis, plasmonics, biology, photovoltaics, and photocatalysis.