

Prof. Mathias Schubert

Mathias Schubert has accomplished more with ellipsometry in the past 10 years than most of us can hope to achieve. He has expanded the theory, understanding, and application of ellipsometry to many diverse areas of interest to both industry and general science. His work in anisotropy and infrared ellipsometry has put him at the forefront of worldwide research. In the process, he has become one of the most prolific ellipsometry authors and all before his 40th birthday.

Mathias started using ellipsometry while still a graduate student at Leipzig University, where he was studying GaInP₂. During these early years, he developed the technique of generalized ellipsometry (g-SE) into a practical method for characterizing anisotropic materials. With a clear understanding of g-SE, the research world was his oyster. He has since applied this method to many difficult anisotropic samples including chiral liquid crystals, mixed-phase Boron Nitride, non-cubic single crystals like sapphire and rutile, and even superlattice-type order-birefringence. His wealth of knowledge in this area is summarized in various references and book chapters, including Chapter 9 of the new Handbook of Ellipsometry (page 8).

Along the path of exploration, Mathias soon discovered the challenges and potential rewards of using ellipsometry in the infrared. He has since become a pioneer of this nearly untapped research area. By combining generalized ellipsometry with IR ellipsometry, he was able to study topics of worldwide interest; including group III-Nitrides for LED and laser diode applications, ordered III-V semiconductors for optoelectronic applications, and electrochromic films. Instead of relying on conventional techniques, Mathias was quick to expand the latest methods to target his characterization requirements. This has led to his pursuit of far-infrared ellipsometry, infrared magneto-optic studies, and even Terahertz ellipsometry.

In recent years, Mathias has also helped expand optical techniques into industrial applications, such as in-line and *in situ* process control with ellipsometry and Raman (see Page 4 for related article on Industrial Integration). His work on functional optical coatings and solar cells has enabled the characterization of new, exciting materials in each area. His current research interest is focused on artificial nanostructure and complex medium electromagnetism, and characterization using g-SE from the Terahertz to the Deep ultraviolet spectral region.

All of his research has combined into a wealth of publications that include over 120 journal articles, 4 book chapters, and a new book on IR ellipsometry (Page 8). He has traveled the world to collaborate with fellow researchers and present his research in over 150 conference talks, including 17 invited lectures.

Mathias generously acknowledges that he couldn't have done all this great work alone and he is fortunate to be surrounded by a great group of ellipsometry researchers. Mathias is pictured (far left) with the Ellipsometry Workgroup at the University of Leipzig. This year sees his career moving forward, as he has accepted an Associate Professor position at the University of Nebraska-Lincoln. UNL has a rich history of ellipsometry-related research that dates back to the early 1960s (before he was born), including their role as host to the early International Conferences on Ellipsometry. Mathias completes the "changing of the guard" with his role as joint-organizer in the next International Conference on Spectroscopic Ellipsometry to be held in Stockholm in 2007 (page 8).

Mathias is busy setting up his new labs with the help of Tino Hofmann, a postdoc also from Leipzig. He will soon be joined in Lincoln by his family. His wife Eva has her Ph.D. in Crystallography and is currently researching three-dimensional nanostructure preparation by glancing-angle deposition. Mathias has three beautiful daughters; Sophie-Luise, Annemarie, and Johanna; between ages 12 and 5. We wish them the best of luck and hope they will be happy to call Nebraska home.

For more information on Mathias and his research, please see the following websites:

Ellipsometry.unl.edu

www.unl.edu/cmra/faculty/schubert.htm

