



Dr. Jorg Maser
Physicist/Group Leader

Theme: X-Ray Microscopy
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Research Summary:

Research interests include high resolution X-ray optics, hard X-ray microscopy and its application to nanoscale science, materials science, biological and medical science and environmental science. Experimental expertise is in x-ray fluorescence microscopy, x-ray diffraction, and transmission x-ray microscopy.

Selected Recent Publications:

K. Ted Thurn, Eric M.B. Brown, Aiguo Wu, Stefan Vogt, Barry Lai, Jorg Maser, Tatjana Paunesku, Gayle E. Woloschak, "Nanoparticles for Applications in Cellular Imaging," *Nanoscale Res. Lett.* 2 (9), 430-441 (2007).

Hanfei Yan, Jorg Maser, Albert Macrander, Qun Shen, Stefan Vogt, G. Brian Stephenson, Hyon Chol Kang, "Takagi-Taupin description of x-ray dynamical diffraction from diffractive optics with large numerical aperture," *Phys. Rev. B* 76, 115438-1-115438-13 (2007).

Tatjana Paunesku, Tianyi Ke, Rohan Dharmakumar, Nicole Mascheri, Aiguo Wu, Barry Lai, Stefan Vogt, Jörg Maser, Kenneth Thurn, Barbara Szolc-Kowalska, Andrew Larson, Raymond C. Bergan, Reed Omary, Debiao Li, Zheng-Rong Lu, Gayle E. Woloschak, "Gadolinium-conjugated TiO₂-DNA oligonucleotide nanoconjugates show prolonged intracellular retention period and T1-weighted contrast enhancement in magnetic resonance images," *Nanomedicine* 4 (3), 201-207 (2008).

Hyon Chol Kang,¹ Hanfei Yan, Robert P. Winarski, Martin V. Holt, Jörg Maser, Chian Liu, Ray Conley, Stefan Vogt, Albert T. Macrander, G. Brian Stephenson. "Focusing of hard x-rays to 16 nanometers with a multilayer Laue lens". *App. Phys. Lett.* 92, 221114 (2008)

Hanfei Yan, Özgür Kalenci, I. Cevdet Noyan, and Jörg Maser. "Coherency effects in nanobeam x-ray diffraction analysis". *Journ. App. Phys.* 104, 023506 (2008)

Awards include three R&D 100 awards, most recently a 2009 R&D100 award for the Hard X-ray Nanoprobe at Argonne National Laboratory.