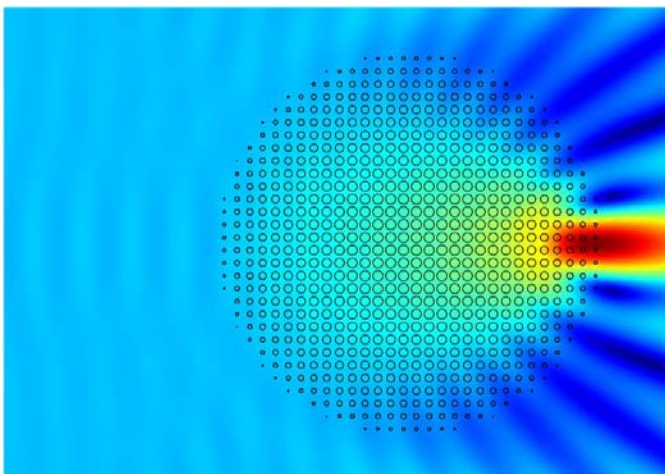




**Di, 6.12.2011, 11 Uhr c.t.**  
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**“Controlling electromagnetic fields by photonic  
and plasmonic crystals in the metamaterial regime”**

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Photonic and plasmonic crystals are artificial electromagnetic media obtained by periodic repeating of unit cells. In the graded crystals, the unit cells are spatially varying. In the metamaterial regime, it is possible to homogenize the crystals and to obtain effective electromagnetic materials. We discuss the photonic band gaps in the crystal and the guiding of an electromagnetic field by the graded crystals. The plasmonic crystals have a band gap due to localized surface plasmon resonances and due to a negative effective permittivity. These band gaps are very

robust to the positional disorder of the unit cells. The plasmonic crystals with semiconductors enable very sensitive modulation of the band gap due to plasmonic resonances. Graded photonic crystals are used for the implementation of transformation optics and gradient refractive index optics. The graded plasmonic crystals with semiconductors make possible gradient refractive index optics with the dynamic control of field focusing and deflection.