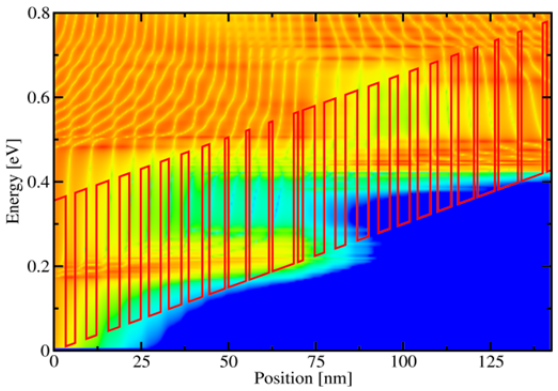
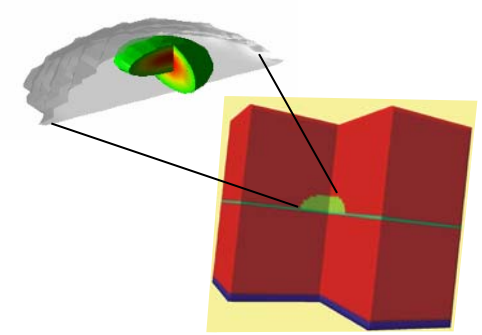
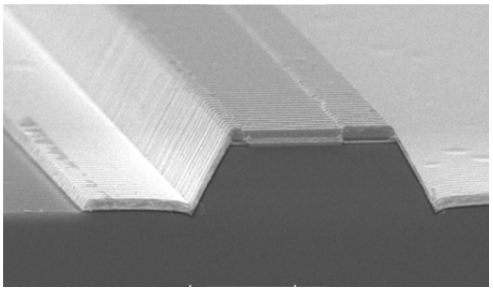
3. FWF SFB IR-ON Symposium:

InfraRed Optical Nanostructures



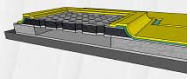




9. November 2012,

9-17 Uhr

Location: **Theatersaal der Akademie der Wissenschaften, Sonnenfelsgasse 19, 1010 Wien, 1.Stock**



3. FWF SFB IR-ON Symposium:

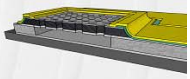
InfraRed Optical Nanostructures

9.November 2012,Theatersaal der Akademie der Wissenschaften, Sonnenfelsgasse 19, 1010 Wien, 1.Stock

The need for environmental sensing, fast trace gas detection, control of hazardous material, pollution control is of critical importance to the modern industrial society. Our quality of life, safety and environmental legacy are all directly affected by the chemical environment we live in and leave behind. Recent geopolitical events have created a demand for new security systems. The optical absorption lines of many important chemical compounds (drugs, explosives and hazardous chemicals) fall into the infrared spectral region (2-20µm). To solve this real world, macro-scale problem, namely the shortage of photonic devices for the infrared wavelength range, we utilize nanostructures, to make significant advances in the understanding and development of future devices.

The realization of semiconductor nanostructures in particular of quantum dots formed by self-organization offers fascinating perspectives both for fundamental physics and for the development of new electronic and photonic devices. Since semiconductor quantum dots resemble "artificial" atoms, their apparent quantum nature can be combined with advantages of the "classical" semiconductor world. In this way these ensembles of semiconductor atoms can be contacted with wires, integrated in circuits and built with high integration. The confinement to the nanometer scale leads to quantized energy levels with energy differences corresponding to the infrared spectral region. Nanostructuring of semiconductors adds new functionality -- infrared optical activity. The goal of the joint effort IR-ON is to investigate, understand, and make use of this infrared optical activity which is entirely determined by quantum size effects. Since the infrared properties are determined by quantum effects and not by material parameters alone we try to give optical activity to a variety of materials including Silicon by using Silicon/Germanium nanostructures - eventually giving future high integrated circuits optical sensing capabilities.

contact: ironsfb@tuwien.ac.at



3. FWF SFB IR-ON Symposium:

InfraRed-Optical Nanostructures

Friday, November 9th, 2012

Theatersaal der ÖAW, Sonnenfelsgasse 19, 1010 Wien, 1. Stock

09:00	Karl Unterrainer, TU Wien	Welcome
09:15	Mathieu Carras, III-IV Labs, Paris	Quantum cascade detectors: modeling and applications
09:45	Gunther Springholz, JKU Linz	Epitaxial lead salt nanostructures for mid-infrared photonics,*TBC*
10:15	Coffee break (30 min)	
10:45	Karsten Held, TU Wien	Electronic correlations in nanostructures
11:15	Armando Rastelli, JKU Linz	Quantum dots in strain-tunable light-emitting diodes
11:45	Lunch break (1,5 hrs)	
13:15	Friedhelm Bechstedt, FSU Jena	Group-IV-based nanocrystals from first principles: Electronic and related properties
13:45	Karl Unterrainer, TU Wien	Novel THz QCLs based on novel materials and designs
14:15	Coffee break & Poster Session (2 hrs)	
16:15	Hans Sigg, PSI Villingen, Schweiz	Gain spectroscopy and modeling of direct gap transitions in Germanium
16:45	Friedrich Schäffler, JKU Linz	Optical Properties of Silicon-Based Nanostructures
17:15	Closing