through such a system which is consistent with our expectations for a negative index lens. From this structure we can now add resonant components to address the magnetic component of the index. Calculations indicate complete phase recovery will be achieved for such a lens at thicknesses of only a few microns. Preliminary optical data will be presented on these structures.

10:30
Sparse random arrays of pristine and doped carbon nanotubes: a tuneable meta material

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Sparse arrays of aligned carbon nanotubes are a fairly dilute meta-material with strongly polarized dielectric properties. Angle resolved electron energy loss-spectroscopy evidences twofold plasmons for the π and the σ interband excitations in freestanding single wall carbon nanotubes. The bare existence of twofold plasmon dispersions is a novelty as compared to conventional bulk material, like graphite. These excitations are identified as a dispersive plasmon propagating along the nanotubes axis and its non-dispersive localized counterpart. The on-axis response is quantitatively identified as the in-plane response of a bare graphene sheet. Further, the dielectric properties of this system can be accurately tailored in *in situ* potassium intercalation. We evidence the emergence of a tuneable intraband charge career excitation. The dispersion of the new plasmon shows that it is the surface plasmon of a metallic meta material. These findings are indeed a critical empirical test for our understanding of strongly polarized nano-meshed meta-materials.

11:00
In vitro effects of carbon based materials

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Carbon based materials are increasingly in the focus of interest because of their very specific mechanical and electrical characteristics. The increased knowledge about the applicability results in a steadily and rapid increase in number of patents. Concurrently, the production of, and as result of that the exposure to, these materials will increase in the near future. However numerous recent publications prove that carbonanotubes (CNT) may induce adverse effects after exposure. So far not much is known about their toxicomechanism. In the present study we determined single walled CNT (SWCNT) concentration-time â effect relationships.