Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Can Carbon Be Ferromagnetic - X Rays Can Give The Answer HENDRIK OHLDAG, Stanford Synchrotron Radiation Laboratory, TOLEK TYLISZCZAK, Lawrence Berkeley National Laboratory, ROLAND HÖHNE, DANIEL SPEMANN, PABLO ESQUINAZI, MAGDA UNGURENEAU, TILMAN BUTZ, University of Leipzig — While conventional wisdom says that magnetic materials have to contain some metallic atoms [1], the confirmation of intrinsic magnetic order in pure metal free carbon represents an ultimate and general scientific breakthrough because of the fundamental importance of carbon as an elemental building block of organic as well as inorganic matter. The common controversy raised across all disciplines is whether the magnetism of carbon is intrinsic or induced by other elements. We address this controversy by providing clear experimental evidence that metal free carbon can be ferromagnetic at room temperature using dichroism x-ray absoprtion spectro-microscopy. For this purpose we acquired x-ray microsopy images of magnetic structures on a thin carbon film that have been produced by irradiation with a focussed 2.25MeV proton beam [2].

[1] F. Palacio, Nature 413, p. 690 (2001)
[2] P. Esquinazi et al., PRL 91, p 227201 (2003)

Hendrik Ohldag
Stanford Synchrotron Radiation Laboratory

Date submitted: 19 Oct 2006 Electronic form version 1.4