



INTERDISCIPLINARY CENTRE FOR
ADVANCED MATERIALS SIMULATION

ICAMS Special Seminar

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Wednesday, November 16, 2:00 p.m. ICAMS Seminar room UHW 11/1102

Where are the Carbon Atoms in Martensite?

This presentation will provide an overview of work carried out at Oxford using atom probe microanalysis, to establish the distribution of carbon atoms in as-quenched and room-temperature aged martensitic steels, and in steels tempered at elevated temperatures. A wide range of phenomena have been observed, including segregation of carbon atoms to grain boundaries, twin boundaries, lath boundaries and thin films of retained austenite; formation of Cottrell atmospheres at dislocations; coherent clustering of carbon atoms in the martensite matrix, apparently by a spinodal process; and the formation of a succession of carbide phases of increasing stability. The inter-relationships between the atomic-scale processes occurring during the various stages of ageing and tempering will be explored. The role of alloying elements in the tempering process will also be discussed.