Dr. R. O. Jones
Forschungszentrum Jülich, Peter-Grünberg-Institut PGI-1
D-52425 Jülich, Germany

What are phase change memory materials, and why are alloys of Ge/Sb/Te the materials of choice?

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ΠΕΡΙΛΗΨΗ
The rewritable optical storage media DVD-RW and Blu-ray Disc-RE are known to everyone, but how many know how they function? Amorphous nanobits in a thin polycrystalline layer must crystallize extremely rapidly and reversibly on a nanosecond time scale. There are very few such materials available, and those used in commercial phase change memory materials are overwhelmingly alloys of Ge, Sb, and Te. I shall outline the history of optical storage materials, show how density functional simulations illuminate the physical processes taking place during crystallization, and explain what is special about alloys of Ge, Sb, and Te in this context. I shall also discuss some of the controversies current in the field.
Βιογραφικό σημείωμα

Robert O. Jones obtained his B. Sc. Hons in Physics at the University of Western Australia in Perth and his Ph.D. at the University of Cambridge, England, under Volker Heine. He spent three years as a postdoctoral associate at Cornell University in Ithaca, NY, USA before joining the Institute of Solid State Research at the Forschungszentrum Jülich. His main focus for over 40 years has been density functional theory and its application to ordered and disordered systems (solids, surfaces, atomic clusters, molecules, polymers, biological molecules, etc.), most recently to structural phase changes.