

## State of the Core

David J. Stevenson  
Caltech

In the past decade there has been a growing consensus that we can understand Earth mantle composition, particularly the moderately siderophile elements, by appealing to a core formation story in which the pressure and temperature of last equilibration corresponds to mid-mantle, perhaps at the base of a magma ocean. The consequences of giant impacts have not yet been fully incorporated into this story. They have only a minor effect on the mantle story (whence the success of existing stories) but a major effect on the state of the core. I will deal with two issues: (1) Stable stratification of the early core. (2) Exsolution. Core formation leaves behind a stable core because the later additions are lighter (more light element content and hotter). This delays the onset of the dynamo and core cooling. Exsolution (primarily of magnesium bearing minerals) then becomes a source of energy for the dynamo and this likely dominates through out most of geologic time. The current core is cooling anomalously fast (as evidenced by the low Urey number) and so the inner core is important at present.