Join the CET and invited guest experts as they debate on some of the fundamental questions about the dynamics of the processes that lead to plumes, LIP’s, hot spots and intra-plate volcanoes. The discussion will concentrate on processes that effect continental lithosphere, as they are relevant to the Australian continent and mineral deposits that still have questionable origin.

The current state of theories on mantle plumes and their relation to classical plate tectonics shows that the “plume” problem in geodynamic research is in a period of serious crisis. The number of publications presenting alternative concepts is steadily increasing. The initial suggestions of plume advocates are disputed, and not without grounds. Questions have been raised for instance as to whether all plumes are derived from the mantle–core interface; whether they all have a wide head and a narrow tail; whether they are always accompanied by uplifting of the Earth’s surface; and whether they can be reliably identified by geochemical and thermal signatures. More generally, the very existence of plumes has become the subject of debate although plumes of a very large size (such as those under the Pacific and under Africa) seem to be indisputable. Alternative ideas contend that all plumes, or hot spots, are directly related to plate-tectonic mechanisms and appear as a result of shallow tectonic stresses, delamination, and /or Rayleigh-Taylor instabilities at the base of lithosphere with subsequent decompression, and melting of the mantle.

12:45 – 13:00 – OPENING STATEMENT Introduction to the debate (Weronika Gorczyk)

GEOCHEMISTRY (lead by Tony Kemp) What geochemical signatures are characteristic for mantle plumes? How signatures from deep mantle differ from signatures from shallow mantle?

Komatiites and LIPs – what the isotopes are telling us?

13.00 – 13.15 – Steve Barnes
13.20 – 13.35 – Svetlana Tessalina
13.35 – 14.05 – Questions and Discussion

PROCESSES and MINERAL SYSTEMS (lead by Yongjun Lu) Are the mineral systems far from subduction zones products of mantle plumes interacting with mantle lithosphere and crust? Is there difference in terms of metal endowment between thermal anomalies from deep mantle and shallow mantle?

14.15 – 14.30 – Jon Hronsky
14.35 – 14.50 – Bruce Hobbs
14.50 – 15.20 – Questions and Discussion
15:20 – 15:45 – Afternoon tea

MECHANICS and TECTONICS (lead by Weronika Gorczyk) What are the mechanic of the thermal/compositional upwellings and downwellings? What tectonic signatures are left in the crust and on the surface? What is the response of the upper mantle of these processes?

15:45 – 16.00 – Franco Pirajno
16.05 – 16:20 – Jean-Pierre Burg
16:20 – 16:50 – Questions and Discussion
16:50 – 17:30 OPEN DISCUSSION
17:30 – 18:30 – nibbles and drinks

Every participant will have 15 min presentation and then after the session will answer pre-prepared questions by the session convener and questions from the public.

The day will end with open debate and summary of the most important arguments presented by the speakers.

19 July 2012
Robert Street Lecture Theatre (G.16), Ground Floor - Robert Street Building, UWA
Please RSVP to cet-training@uwa.edu.au for catering purposes.
Steve Barnes specializes in the geology and geochemistry of nickel sulphide ore deposits, particularly those hosted within ancient ultra-high-temperature lava flows called komatiites. Dr Barnes has been involved in research relating to exploration for magmatic ores, that is, ores formed directly from molten rock, and in particular nickel sulphide ores. Dr Barnes also spent two years as a National Science Foundation (NSF) Postdoctoral Fellow at NASA’s Johnson Space Centre, Houston, Texas, USA. He was part of the team led by Dr Robin Hill which won the CSIRO Chairman’s Medal in 1989.

Franco Pirajno, a senior geoscientist in the Geological Survey of Western Australia (GSWA), has considerable experience in tectonics, ore deposit geology and mineral exploration in Europe, southern Africa, South East Asia, New Zealand, the southwest Pacific, China, Greenland, southern Siberia and Australia. Duties at the GSWA include in-depth studies of mineral systems of WA and comparative analyses with similar systems in other parts of the world. In the last 19 years Franco Pirajno has worked extensively in Western Australia’s Proterozoic terranes and was instrumental in the discovery of a new large igneous province in Australia.

Jon Hronsky has almost 30 years experience in the mining and mineral exploration industry. He is currently a Principal of Western Mining Services (WMS), a consultancy group with offices in Perth and Denver that provides strategic-level services to the global mineral exploration industry. In addition, Jon is a Director of Encounter Resources, a Western Australian focused base-metals junior explorer. Jon graduated with a Bachelor of Applied Science in Mining Geology from the West Australian School of Mines in Kalgoorlie in 1983 and completed a PhD at UWA under Professor David Groves in 1994. His exploration targeting work led to the discovery in 2000 of the West Musgrave NiS province in WA.

Bruce Edward Hobbs is a geologist specializing in structural geology, geomechanics and mineral exploration. He is an Adjunct Professor at UWA and a Research Fellow at CSIRO. He was formerly Chief Scientist of Western Australia and Executive Officer of the Office of Science and Innovation at the Department of the Premier and Cabinet. Previously, he held many academic positions including Foundation Professor of Earth Sciences at Monash University. He has published over 190 scientific papers in international journals and is the author of three books on structural geology and fluid flow in the crust of the Earth.

Jean-Pierre Burg is an internationally renowned structural geologist involved in studies of rock deformation at all scales from the scale of the Alpine-Himalayan mountain chains to micro-scale deformation structures. Jean-Pierre completed master and PhD degree at USTL Montpellier, late he assumed a post as research fellow at Melbourne University. In March 1986 he was appointed Research Director at the CNRS Center for Geology and Geophysics in Montpellier, a post he held until he was called to the ETH, where he is until now leading structural geology group.

Svetlana Tessalina’s main research interests are centered around chemical and temporal evolution of the Earth’s lithosphere and associated mineral deposits formed both by hydrothermal and magmatic processes by means of radiogenic isotope systems, and lithophile and siderophile elements abundances. She began her career at the Institute of Mineralogy in Urals, Russia, where she studied the Volcanogenic Massive Sulphide deposits and continued her studies of ore deposits in the BRGM in France, Natural History Museum in London, and Padova University in Italy. In 2002, Svetlana joined the Institute de Physique du Globe in Paris, where she applied different isotope systematics for the studies of mineral deposits.