



Geofizički odsjek

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O B A V I J E S T

Dana **1.4.2011. (petak!)** u 12⁰⁰ održat će se u okviru seminara i kolokvija na Geofizičkom odsjeku PMF-a sljedeća dva izlaganja (predviđeno trajanje prvog izlaganja ~40', a drugog ~20'):

1) Prof. Nicholas Rawlinson

*(Research School of Earth Sciences, The Australian National University,
Canberra, Australia):*

The nature of the lithosphere beneath southeast Australia from seismic tomography

ABSTRACT: The eastern one-third of the Australian continent comprises a series of Palaeozoic fold belts that formed largely as a result of subduction-accretion against the proto-Pacific margin of Gondwana. This younger part of the Australian lithosphere, which abuts the Proterozoic and Archean terranes of central and western Australia, is not well understood, in part due to the wide expanse of younger sedimentary and volcanic cover sequences which mask large regions of the underlying Palaeozoic terrane. Major questions which remain unanswered include: (1) what is the location and nature of the transition between Precambrian and Phanerozoic Australia?; (2) are continental fragments rifted from the supercontinent Rodinia during breakup present within the accretionary terrane?; (3) what configuration of subducting plates was responsible for the outward stepping sequence of orogens that formed?; and (4) is western Tasmania, which has clear Proterozoic antecedents, a salient of the former Gondwana supercontinent, or an isolated fragment of old lithosphere?

In order to address these and other important questions about the Australian lithosphere, the WOMBAT transportable array project was initiated in 1998 in western Victoria. To date over 550 stations have been installed in southeast Australia at spacings ranging between 15-50 km, resulting in a dense coverage of passive seismic recordings throughout southeast Australia. Teleseismic tomography, ambient noise tomography and receiver function techniques have so far been applied to the data in order to obtain detailed images of the crust and upper mantle. In this talk, I will focus on results obtained from combining surface wave and teleseismic data that reveal detailed and robust 3-D variations in seismic properties in the mantle lithosphere. One of the traditional limitations of teleseismic tomography is that the use of relative arrival time residuals makes the simultaneous inversion of multiple datasets recorded at different times difficult to reconcile; in particular, longer wavelength structure will be filtered out, resulting in a high-pass filtered image. One way to overcome this problem is to use a starting model that contains the broad-scale features that cannot be recovered from the teleseismic data. In this case I use a 3-D shear-wavespeed model derived from surface wave tomography, which is converted to P-wavespeed via AK135 Vp/Vs ratios. Despite this assumption, the results of the teleseismic inversion appear to be reliable, with the presence of major structures corroborated by other studies. Of particular note is the clear imaging of the eastern edge of the Delamerian Orogen, which underlies the surface expression of the younger Lachlan Orogen which lies to the east. Another distinct feature is a zone of low velocity in the upper mantle which underlies the Quaternary Newer Volcanic Provinces, a hot-spot related zone of basaltic volcanism.

2) Prof. Hrvoje Tkalčić

*(Research School of Earth Sciences, The Australian National University,
Canberra, Australia):*

Benfordov zakon u prirodnim znanostima

SAŽETAK: Prije više od sto godina, astronom Newcomb primjetio je da su stranice na početku logaritamskih tablica izlizane od upotrebe više nego stranice pri sredini ili kraju. To je značilo da su brojevi koji počinju jedinicom pregledani više puta od onih koji počinju drugim znamenkama. Predložio je da razdioba prvih znamenki u nekom skupu podataka nije uniformna, nego da se jedinice pojavljuju češće od dvojki, dvojke češće od trojki, itd. To je točno neovisno o referentnom sustavu jedinica. Benford je tridesetih godina dvadesetog stoljeća proširio zakon i pokazao da on mora vrijediti i kada se promijeni brojevnica baza. Zakon vrijedi kada za razne skupove podataka iz svakodnevnog života, npr. od duljina svih rijeka u nekoj državi, do baza podataka američke bejzbol lige. Benfordov zakon se u novije vrijeme koristi i za razotkrivanje poreznih prijevara.

U ovom izlaganju pokazat ću da Benfordov zakon vrijedi za skupove podataka iz različitih područja znanosti, od tomografskih modela Zemlje i dubina potresa, preko frekvencija pulsara, mase ekstrasolarnih planeta, do broja infektivnih bolesti prijavljenih Svjetskoj zdravstvenoj organizaciji. Osim toga, pokazat ću kako se dolazak valova potresa može opaziti samo iz prvih znamenki mjerenja pomaka čestica tla.

Pozivaju se studenti, apsolventi i svi zainteresirani da prisustvuju predavanju, koje će se održati u predavaoni br. 2 Geofizičkog odsjeka PMF-a, Horvatovac 95, Zagreb. Studentima 2. godine diplomskog sveučilišnog studija fizika - geofizika je prisustvovanje predavanjima u sklopu Geofizičkog seminara obavezno.