

V-254 Visit Prof. Ali Alpar

Report on my sabbatical Visit to API, U. of Amsterdam - Nov. 2017 through Jan 2018 -- M. Ali Alpar

a) I have had several discussions with Michiel van der Klis on a new resonance model for kilohertz QPOs that I have been developing.

b) I have worked on revisiting our work with Michiel van der Klis, Ed van den Heuvel and Ale Patruno on the 11 Hz LMXB IGR J17480-2446 in Terzan 5 : this involved an evolutionary scenario in which in an earlier epoch the neutron star was spundown by wind accretion from the companion. Now that LIGO results point to weaker-less efficient winds it became interesting to look at the implications for this source. I concluded that there is no qualitatively significant change in our earlier age estimates.

c) I continued work with my group at Sabanci University (i) to estimate the critical strain angle in the neutron star crust; and (ii) on nonlinear timing behavior due to internal torques and how to subtract this to get cleaner estimates of braking index reflecting effect of external torque only.

d) I attended discussions of the group of Joeri van Leeuwen, and Jason Hessels. A common interest on the transitional millisecond pulsars emerged from this. During my stay at API, Sabanci University colleague Ünal Ertan sent a preprint applying his new development of a propeller model successfully to t-MSPs, I started working on this and intend to continue discussions with Jason Hessels and Amruta Jaodand. I intend to continue joint work on this.

e) Colleagues Nicolas Chamel (Brussels) and Jim Sauls (Northwestern U.) visited to discuss collaborative research on neutron star superfluidity and crust physics.

f) I gave an informal talk at API and a colloquium in Leiden on our recently obtained (with E. Gügercinoglu) general solution of the two component model for neutron stars with superfluid interiors under arbitrary time dependent external torques on the neutron star (both for linear and nonlinear coupling of the superfluid interior).

g) We worked with Rudy Wijnands, Natalie Degenaar and other members of the SOC on the organization of event 1.10, The Structure, Dynamics and Evolution of Neutron Stars for the upcoming COSPAR General Assembly in Pasadena July 2018,

This was a very interesting and fruitful visit for me. I thank API for hospitality and the great research environment, and NOVA for the financial support that made this visit possible.

With best wishes,

M. Ali Alpar