NOVA Grant V-249

Report of the participation of E.P.J. van den Heuvel in the research Programme "The Mysteries and Inner Workings of Massive Stars" at the Kavli Institue for Theoretical Physics (KITP), University of California, Santa Barbara, from 27 February till 28 April 2017.

I was invited on 17 November 2016 by the director of the KITP to participate in this programme. The KITP took care of the costs of my stay in Santa Barbara with a per diem of $ 85,- per day, but could not reimburse the costs of my travel, and for the KITP conference from 20-24 March 2017, that was connected with the program.

I am grateful to NOVA for granting me a subsidy of Eu 1420,- for the travel and the participation in the conference.

Here below I copy the Activity Report that I made for the KITP and which describes briefly my activities during the 2 months of my stay in Santa Barbara. As mentioned in the Activity Report, my work during this period resulted in two scientific papers, which have already been accepted for publication in international scientific journals: in the Monthly Notices of the Royal Astronomical Society (London) and the Journal of Astrophysics and Astronomy (Springer-India).

KITP: Activity Report of E.P.J. van den Heuvel, participant of the KITP program "The Mysteries and Inner Workings of Massive Stars (Stars 17)", from 27 February till 28 April 2017.

For my research the participation in the program has been very important. I particularly benefitted very much for my work on binary evolution from the lectures on stellar wind mass loss (by J. Vink and S. Owocki), on Luminous Blue Variables (by N. Smith), on Common-Envelope evolution (by N. Ivanova), on binary evolution (by P. Podsiadlowski and C. Belczynski) and on stellar core collapse (by T. Foglizzo and C. Fryer).

Intensive discussion with N. Ivanova and C. Belczynski on the stability of mass transfer in very massive binaries were very important for me for getting a better understanding of the formation of Wolf-Rayet X-ray Binaries and double black holes.

On Tuesday 14 March, I gave a one hour research presentation, entitled "Making Wolf-Rayet X-ray Binaries and Double Black Holes through the evolution of High-Mass X-ray Binaries with stable Roche-lobe overflow".

In the week 20 through 24 March I participated in the Conference associated with the 'Stars 17' Program.

Two research papers resulting from my work at KITP, were accepted for publication by international research journals:

1. "Forming short-period Wolf-Rayet X-ray Binaries and double black holes through stable mass transfer", by E.P.J. van den Heuvel, S.F. Portegies Zwart and S.E. de Mink, was accepted by Monthly Notices of the Royal Astronomical Society.
2. "Formation of Double Neutron Stars, Millisecond Pulsars and Double Black Holes", by E.P.J. van den Heuvel, was accepted by Journal of Astrophysics and Astronomy (Springer India).

I look back on a very successful and inspiring two-months stay and I thank the organizers and the KITP for have given me the opportunity to participate in this exciting scientific program.

Edward P.J. van den Heuvel, University of Amsterdam, The Netherlands. April 28, 2017