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***Zahra Altaha Motahar*** (University of Oldenburg)

## **Neutron stars in massive scalar tensor theory with self interaction**

### **Abstract**

Although the effect of spontaneous scalarization of neutron stars can be very large, binary pulsar observations and gravitational wave detections significantly constrained the massless scalar-tensor theories. Therefore, the deviations of physical properties of neutron stars in the massless STT case from GR is very small. However, if we consider a nonzero mass of the scalar field, the parameters in the massive case have are not restricted by the observations, resulting in the large deviations of massive scalarized solutions from the pure GR.

In this talk, I will present neutron stars in the scalar-tensor theory with massive field and self-interaction term in the potential. The self interacting term additionally suppresses the scalar field in the neutron star models. Having the fixed coupling constant and mass of the scalar field the effect of scalarization decreases by increasing the value of self interaction parameter. In our ongoing project we are calculating the static and slowly massive scalarized neutron stars with self interacting term employing various equations of state. In addition, we are computing the axial quasi normal modes of these neutron star models.