

RTG Colloquium Models of Gravity	
Date:	06.11.2019
Time:	10:30 - 17:30 hrs
Location:	University of Oldenburg, A14 1-111

Program	
10:30 – 11:30 hrs	Students' Seminar: Christian Hoffmann (Oldenburg, Germany) <i>"Solitons in gravity and non-linear systems"</i>
11:30 - 12:00 hrs	<i>Discussion and coffee</i>
12:00 - 12:30 hrs	Journals' Club: Sarah Kahlen (Oldenburg, Germany) <i>"Einstein-Maxwell-scalar black holes: classes of solutions, dyons and extremality"</i>
12:30 - 14:00 hrs	<i>Lunch</i> <i>Board meeting</i>
14:00 – 15:00 hrs	Talk 1: Ahmad Sheykhi (Shiraz, Iran / Oldenburg, Germany) <i>"Origin of MOND Theory"</i>
15:00 - 15:30 hrs	<i>Coffee and discussion</i>
15:30 - 16:30 hrs	Talk 2: Sravan Kumar (Groningen, Netherlands) <i>"R² like Inflation in Infinite derivative gravity"</i>
16:30 - 16:45 hrs	<i>Coffee and discussion</i>
16:45 - 17:45 hrs	Women's Assembly
18:00 - hrs	<i>Dinner</i>

Abstracts

Talk 1: **Ahmad Sheykhi** (Shiraz, Iran / Oldenburg, Germany)

“Origin of MOND Theory”

We address the origin of the Modified Newtonian Dynamics (MOND) theory by adopting the viewpoint that gravity is not a fundamental force and instead it can be regarded as the entropic force. By modifying the area law of entropy, we also find the corrections to the Newton's law of gravity at small distances.

Talk 2: **Sravan Kumar** (Groningen, Netherlands)

“ R^2 like Inflation in Infinite derivative gravity”

In this talk, I will briefly introduce infinite derivative quadratic curvature gravity which is ghost free around maximally symmetric space times. I will show that Starbinsky inflation can be exact solution of the theory. I will discuss the implications of non-localities in the two point and 3-point correlations which lead to viable inflationary observables such as spectral tilts, tensor to scalar ratio and non-Gaussianities. I will discuss the scope of the model which can be tested with future CMB data.

Journals' Club: **Sarah Kahlen** (Oldenburg, Germany)

“Einstein-Maxwell-scalar black holes: classes of solutions, dyons”

Spherical black hole (BH) solutions in Einstein-Maxwell-scalar (EMS) models wherein the scalar field is non-minimally coupled to the Maxwell invariant by some coupling function are discussed. A classification for these models into two classes is suggested, based on the properties of the coupling function. These allow, or not, the Reissner-Nordström (RN) BH solution of electrovacuum to solve a given model. The two classes lead to dilatonic (with RN being no solution) and scalarized (with RN being a solution) BHs, whose features are presented. It is also shown that electrically and magnetically charged BHs, called dyons, can have a smooth extremal limit in the scalarized case, but not in the purely electric or magnetic case. The finding that both charges are necessary for extremal solutions to exist can be explained by using the entropy function formalism.