

## CoE-MaSS weekly seminar series

THE DST-NRF CENTRE OF EXCELLENCE IN MATHEMATICAL AND  
STATISTICAL SCIENCES (CoE-MaSS) WOULD LIKE TO PRESENT  
A SEMINAR BY

**Prof Andronikos Paliathanasis**

*(Universidad Austral de Chile, Valdivia, Chile)*

*“The journey so far”*

Wednesday, 07 December 2016  
10h30-11h30

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**Broadcast live from:**

Videoconferencing Facility, 1st Floor  
Mathematical Sciences Building, Wits West Campus

**How to connect to this seminar remotely:**

You can connect remotely via Vidyo to this research seminar by clicking on this link:

<http://wits-vc.tenet.ac.za/flex.html?roomdirect.html&key=y0SSOwFsvsidbzg4qFdWXvvQtyl>

and downloading the Vidyo software before the seminar.

You must please join in the virtual venue (called “*CoE Seminar Room (Wits)*” on Vidyo)  
strictly between **10h00-10h15**. No latecomers will be added.

**Important videoconferencing netiquette:**

Once the seminar commences, please mute your own microphone so that there is no feedback from your side into the virtual room. During the Q&A slot you can then unmute your microphone if you have a question to ask the speaker.

**Title:**

The journey so far

**Presenter:**

Prof Andronikos Paliathanasis, Universidad Austral de Chile, Valdivia, Chile,  
[anpaliat@phys.uoa.gr](mailto:anpaliat@phys.uoa.gr)

**Abstract:**

The connection between symmetries of second-order differential equations with the collineations of the underlying space in which the motion occurs is the main subject of this talk. For that we study the Lie and Noether point symmetries of a class of systems of second-order differential equations with  $n$  independent and  $m$  dependent variables ( $n \times m$  systems). We solve the symmetry conditions in a geometric way and determine the general form of the symmetry vector and of the Noetherian conservation laws. We prove that the point symmetries are generated by the collineations of two (pseudo)metrics, which are defined in the spaces of independent and dependent variables. We demonstrate our results by presenting various applications of physical interests.

**Biography:**

Andronikos received his PhD from the University of Athens in 2015. He is on the second year of Fondecyt postdoc at UACH. His research interests lie in the fields of gravitational physics, cosmology and differential equations; with emphasis on the dark energy models and the late time acceleration of the universe.