

# **Functional Analysis and Mathematical Physics**

## **Interdepartmental Research Group**

### **(FAMP)**

#### **Colloquium Series**

**Fall 2017**

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#### *Talk 1: Evolution of Maximally Symmetric Spaces under the Ricci Flow*

Prof. Alfredo Herrera-Aguilar (Benemérita Universidad Autónoma de Puebla)

#### **Abstract.**

In this talk, we present exact solutions to the Ricci flow equations in 3 and 4 dimensions. We solve the flow equations starting with an ansatz for the metric and the DeTurck vector field in  $n = 3$ . Our solution belongs to the family of maximally symmetric spaces and the treatment can be easily generalized to  $n \geq 4$ . Our solutions can be divided into maximally symmetric spaces with positive and negative curvature. The flow always increases the curvature for both de Sitter and Anti-de Sitter spaces. Between both scenarios there is a “critical point” where the curvature blows up. An interesting feature of the solution with  $n \geq 4$  is that the flow equations are satisfied with a Euclidean or Lorentzian signature. Another interesting effect of the flow consists in a change of signature in the metric when passing from a de Sitter space to an Anti-de Sitter space throughout the flow.

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**Wednesday, August 23, 2017, 1:00-2:00 PM, PB 428**