

S E M I N A R



**Prof Naresh Dadich**  
*(Inter-University Centre for  
Astronomy and Astrophysics  
(IUCAA), India)*

**Date:**

Thursday, 8 May 2025

**Time:**

12h15-13h15 SAST

**Venues:**

- **NITheCS Seminar Room**  
University of KwaZulu-Natal  
Westville Campus  
3rd Floor, H-Block,  
School of Chemistry and Physics
- **Online**

# A black hole or Buchdahl star, or both?

**ABSTRACT:**

Since gravity is strongest, though the weakest in strength, it finally wins over all other forces. When all the matter field degeneracies like electron and neutron have been won over, the equilibrium state could then only be governed by the motion of free elements/particles resisting gravity, and there is no other interaction.

As expected, there can occur only two equilibrium states, one for massive particles and the other for massless particles. It turns out that the former defines the Buchdahl star with  $M/R = 4/9$  while the latter gives the black hole with  $M/R = 1/2$ . In the collapse, the former will occur first and then the latter. It is remarkable that the ultimate end state of gravitational collapse is either a Buchdahl star or a black hole.

**Prof Naresh Dadhich** is Emeritus Professor at the Inter-University Centre for Astronomy & Astrophysics, India.

**WHO SHOULD ATTEND?**

This talk is intended to be accessible to postgraduate students. All are welcome!

**ENQUIRIES:**

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