Paper Pencil Principal

DEFINITION:

Theoretical astrophysicists use physical principals to develop models of the Universe and its constituents. These models provide a framework that allows us to interpret observations and, conversely, observations tell us which models are the most plausible. This interplay between theory and observations is an important component of astrophysics research and is highly valued at MKI.

Researchers at MKI work

on a broad range of topics in theoretical astrophysics,

- [ED BERTSCHINGER GROUP]:

Formation Of CosmicStructure, the physics of dark matter, the physics of gravitation, and the processes governing matter and radiation close to black holes.

- [ALAN GUTH GROUP]:

Application of Theoretical particle physics to the early universe, including the inflationary cosmological model.

- [SCOTT HUGHES GROUP]:

Astrophysical General relativity, focusing in particular upon black holes and gravitational-wave sources.

- [ ] PAUL JOSS GROUP:

Theory Of Neutron Stars, Supernovae, And Binary Systems.

- [ ] SAUL RAPPAPORT GROUP:

Formation And Evolution Of Binary systems containing collapsed stars — white dwarfs, neutron stars, and black holes.

- [ ] SARA SEAGER GROUP:

Atmospheric composition and the interior structure of exoplanets, with a focus on the new and growing data set of transiting exoplanets.

- [ ] MAX TEGMARK GROUP:

Precision cosmology, e.g.,

combining theoretical work with new measurements to place sharp constraints on cosmological models and their free parameters.

▢ **NEVIN WEINBERG GROUP**:

Compact objects, tides and binary evolution, stellar oscillations, and explosive thermonuclear burning.

REFERENCE:

https://space.mit.edu/research/pencil-paper/#:~:text=Theoretical%20astrophysicists%20use%20physical%20principals,models%20are%20the%20most%20plausible.