BOSTON UNIVERSITY

Astrophysics Seminar
Monday, November 3, 2014

Schmidt's Conjecture and Star Formation in GMCs and Galaxies

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3:15 pm
Refreshments
CAS Room 500

3:30 pm
Seminar
CAS Room 502

Abstract:

Ever since the pioneering work of Maarten Schmidt a half-century ago there has been great interest in finding an appropriate empirical relation that would directly link some property of interstellar gas with the physical process of star formation within it. Schmidt conjectured that this might take the form of a relation between the rate of star formation (SFR) and the surface density of the interstellar gas. In this talk I will describe how recent observations of nearby GMCs are now providing new insights into the nature of this relationship. I will show that, although a Schmidt relation is observed within individual molecular clouds, there is no Schmidt law that characterizes star formation between clouds. Instead, a linear scaling relation exists connecting the total SFR and the amount of dense gas within GMCs. This scaling law may be the underlying physical relationship that most directly links star formation with molecular gas between GMCs in the Milky Way and also within and between external galaxies. Finally, I will discuss the implications of these results for understanding the nature of the Kennicutt-Schmidt scaling law for galaxies.

Next Week

- *Phil Myers*
  Center for Astrophysics
- How Stars Acquire Their Mass

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