

THE SHAPE AND MOTIONS OF GAS FILAMENTS IN STELLAR NURSERIES

What is the science question?

We see wispy filaments of gas and dust in star-forming regions in our Milky Way galaxy. How are these gas filaments formed, and how are they related to star formation?

What were your findings?

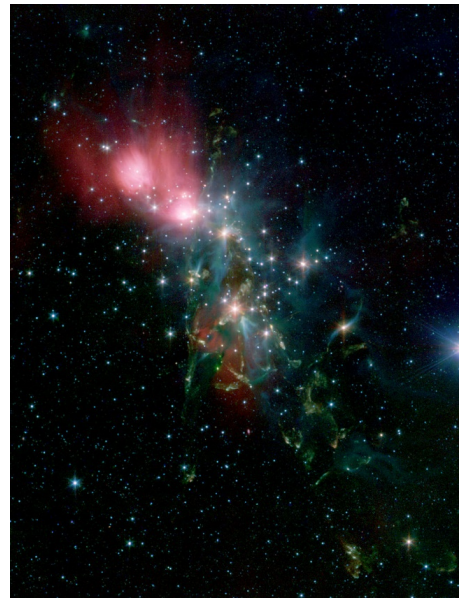
- The primary motion of material in the filaments is perpendicular to the filament major axis.
- Most filaments are made up of multiple overlapping sub-filaments.
- Protostars are preferably located at the overlapping regions.

What was the impact?

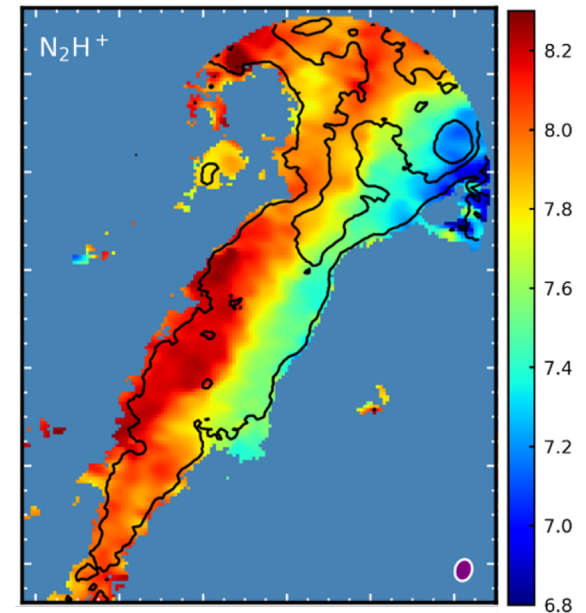
Gas filaments are formed by accretion of material in shock layers created by the collision of turbulent gas cells. Formation of protostars is possibly related to interactions between sub-structures of these filaments.

Why does it matter to non-scientists?

This study helps further our understanding about how stars like our Sun are born in the gas clouds that harbor stellar nurseries.



NGC 1333 is a stellar nursery located in our Milky Way only 1,000 light years away. Detailed study of these objects helps us understand how stars are born.



This plot shows the motion of the gas in one of the filaments in NGC 1333 (in km/s).

Arnab Dhabal (665, UMD), Lee Mundy (665, UMD), Maxime Rizzo (667), Shaye Storm (Harvard-CfA) and Peter Teuben (UMD), 2018, "Morphology and Kinematics of Filaments in the Serpens and Perseus Molecular Clouds", The Astrophysical Journal, 853:169