Dust free gas in the Milky Way?

Toney Minter

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Smith High Velocity Cloud

- Galaxies need new gas to continue forming stars
- High velocity clouds (HVCs) are a potential source of new gas
- Smith Cloud is the most massive HVC

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Smith High Velocity Cloud

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Smith High Velocity Cloud

- Searched for molecules with Green Bank Telescope (GBT)
- No hydroxl (OH) found
- Indicates undetectable levels of dust and molecules in the Smith HVC

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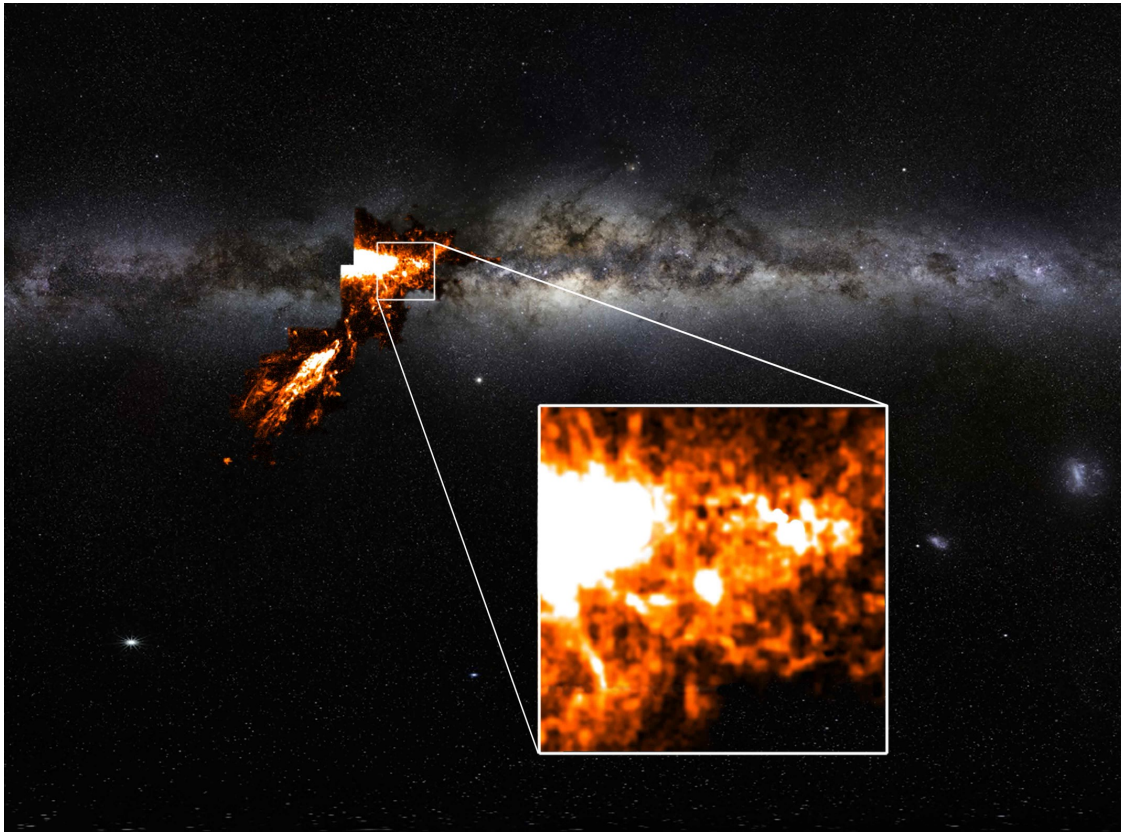
Smith Cloud Leading Component

- Leading component interacting with our galaxy



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Smith Cloud Leading Component

- Leading components should not have molecules and dust
- ”Normal” Milky Way clouds would be expected to have molecules and dust
- Used the GBT to search for OH in Leading Component and regular Milky Way clouds

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Dustless Clouds?

- Did not detect OH in Smith Cloud Leading components
- Did not detect OH in control sample of Milky Way clouds

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More to the data

- Data contain more information than if OH is present in Smith Cloud
- Smith Cloud is “behind” most of Milky Way
- Look through several spiral arms in inner galaxy

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More to the data

- Observations looked above/below the plane more than previous observations
- OH detected in the spiral arms of the Milky Way
- Can use the observations to see how thickness of the molecular “layer” in the Milky Way

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More to the data

- In outer galaxy “scale height” was found to be 658 ly (200 pc)
- We find a scale height of about 329 ly (100 pc) in the inner galaxy
- Inner and outer galaxy have different thickness for the molecular layer

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