Atmospheric molecular blobs shape up circumstellar envelopes of AGB stars

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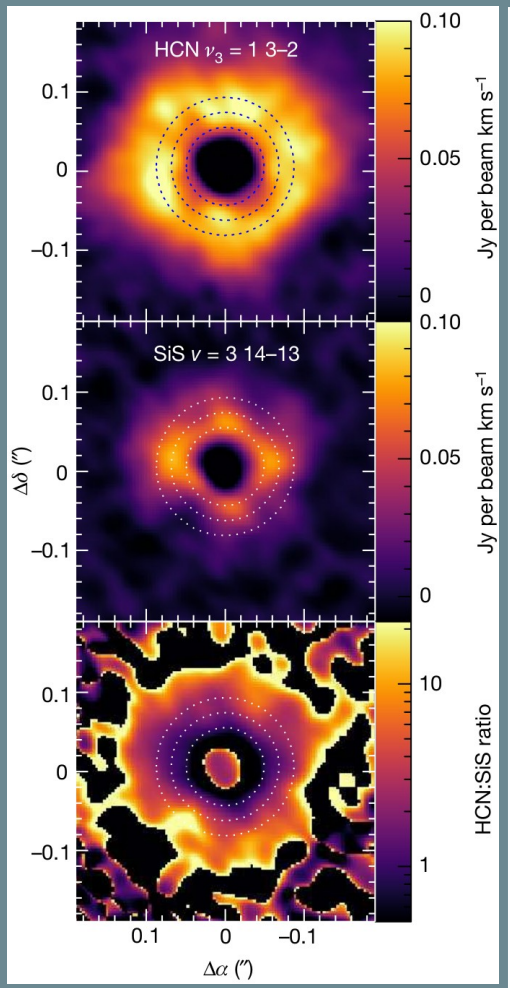
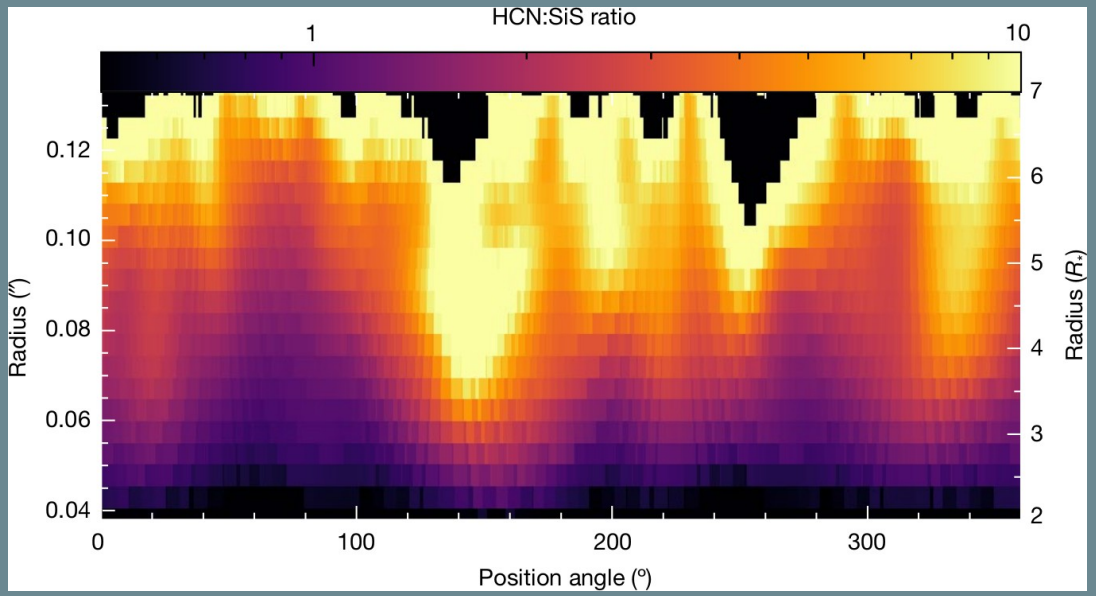


Emission of HCN and SiS rotational lines and their ratio close to the star.

During the late asymptotic giant branch evolutionary stage (AGB), stars eject material that forms extended circumstellar envelopes composed of molecular gas and dust grains. These envelopes are inhomogeneous close to the central star while at larger distances, incomplete complex structures resembling giant spirals and roughly concentric arcs are frequently found. There is observational evidence which support that these large scale structures are consequence of the orbital movements of the stars in binary systems but it is not known why these structures are incomplete. The lack of sufficient spatial resolution has hampered thus far a reliable description of the atmospheres of AGB stars and close layers and how the material is subsequently driven toward the interstellar medium. We demonstrate for the



HCN:SiS ratio as a function of the distance from the star and the position angle to evidence the strong anisotropies related to chemistry in the inner layers of the envelope of IRC+10216.

archetypal carbon rich AGB star IRC+10216 that the formation of refractory molecular species as well as their condensation on dust grains are anisotropic processes. This anisotropy is thought to be finally reflected on the incompleteness of the large scale structures and the complexity of matter ejection mechanism.

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