Catalogue of Young Stellar Objects (YSO)

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Indian astronomers have compiled one of the largest catalogues ofyoung stellar objects (YSOs)using data fromNASA's WISEandNEOWISE missions. A young stellar object (YSO) is aforming starsurrounded by rotating disks of gas and dust. It becomes a mature star once it reaches the main sequence and beginsstable hydrogen fusion.

Key Findings:

- Heat Source:Protostarsgenerate heat throughgravitational collapse(*contraction due to own gravity*) andmass accretion, unlikemature starsthat emit energy vianuclear fusion.
- Episodic Accretion:The protostar'sbrightness fluctuatesas disk material intermittently falls onto the star, with intense bursts followed by quieter lulls.
- Six Types:The study classified YSO brightness variability intosix behavioural categories.
- Patterns:Linear (*steady change*), Curved (*nonlinear*), Periodic (*repeating cycles*), Burst (*sudden brightening*), Drop (*abrupt dimming*), and Irregular (*chaotic*).
- Variability Share:About 26% of observed YSOs showed detectable brightness fluctuations, with 'irregular'variability(*violent and unpredictable*) being themost common.
- Age Link:The study found a clear correlation betweenstellar ageandstability, with 36% of Class I YSOs (*the earliest stage*) showing variability compared to 22% Class III YSOs.

Colour Variability:Whilemost YSOsbecame 'redder' as they brightened, some of theyoungest starsappeared 'bluer' because ofincreased accretionepisodes