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1 ABSTRACTS OF RECENTLY ACCEPTED PAPERS

Resumos de artigos aceites recentemente

IRS Characterization of a Debris Disk around an M-type star in NGC2547

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We present 5 to 15 micron Spitzer Infrared Spectrograph (IRS) low resolution spectral data of a candidate debris disk around an M4.5 star identified as a likely member of the ~ 40 Myr old cluster NGC2547. The IRS spectrum shows a silicate emission feature, indicating the presence of warm, small, (sub)micron-sized dust grains in the disk. Of the fifteen previously known candidate debris disks around M-type stars, the one we discuss in this paper is the first to have an observed mid-infrared spectrum and is also the first to have measured silicate emission. We combined the IRS data with ancillary data (optical, JHKs, and Spitzer InfraRed Array Camera and 24 micron data) to build the spectral energy distribution (SED) of the source. Monte Carlo radiation transfer modeling of the SED characterized the dust disk as being very flat ($h_{100}=2\text{AU}$) and extending inward within at least 0.13AU of the central star. Our analysis shows that the disk is collisionally dominated and is likely a debris disk.

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<http://de.arxiv.org/abs/0905.2469>

A Very Large Telescope/NACO Study of Star Formation in the Massive Embedded Cluster RCW 38

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We present the results of high angular resolution adaptive optics (AO) near-infrared (JHKs) observations of the deeply embedded massive cluster RCW 38 using NACO on the Very Large Telescope. Narrowband AO observations centered at wavelengths of $1.28\ \mu\text{m}$, $2.12\ \mu\text{m}$, and $2.17\ \mu\text{m}$ were also obtained. The area covered by these observations is about $0.5\ \text{pc}^2$, centered on the O-star RCW 38 IRS 2. We use the JHKs colors to identify young stars with infrared (IR) excess in this region. Through a detailed comparison to a nearby control field, we find that most of the 337 stars detected in all three IR bands are cluster members (~ 317), with essentially no contamination due to background (likely due to the high cluster extinction of $AV \sim 15$) or foreground sources. Five sources with three band detections have colors suggestive of deeply embedded protostars, while 53 sources are detected at Ks only; their spatial distribution with respect to the extinction suggests they are highly reddened cluster members but their evolutionary status is unclear. Detectable Ks -band excess is found toward $29\% \pm 3\%$ of the stars. For comparison to a similar area of Orion Nebula Cluster observed in the near-IR, mass and extinction cuts are applied, and the excess fractions redetermined. The resulting excesses are then $25\% \pm 5\%$ for RCW 38, and $42\% \pm 8\%$ for Orion. RCW 38 IRS 2 is shown to be a massive star binary with a projected separation of $\sim 500\ \text{AU}$. Two regions of molecular hydrogen emission are revealed through the $2.12\ \mu\text{m}$ imaging. One of these shows a morphology suggestive of a protostellar jet, and is clearly associated with a star only detected at H and Ks, and previously identified as a highly obscured X-ray source. Three spatially extended cometary-like objects, suggestive of photoevaporating disks, are identified, but only

one is clearly directly influenced by RCW 38 IRS 2. The structure of the inner core of RCW 38 is also characterized and compared to Orion and other clusters. A King profile provides a reasonable fit to the cluster radial density profile and a nearest-neighbor distance analysis shows essentially no subclustering.

Based on observations performed at the European Southern Observatory Very Large Telescope on Cerro Paranal, Chile, under program ID 70.C-0400(A).

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<http://de.arxiv.org/abs/0904.3279>

Dense Cores in The Pipe Nebula: An Improved Core Mass Function

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In this paper, we derive an improved core mass function (CMF) for the Pipe Nebula from a detailed comparison between measurements of visual extinction and molecular-line emission. We have compiled a refined sample of 201 dense cores toward the Pipe Nebula using a two-dimensional threshold identification algorithm informed by recent simulations of dense core populations. Measurements of radial velocities using complimentary C¹⁸O (1-0) observations enable us to cull out from this sample those 43 extinction peaks that are either not associated with dense gas or are not physically associated with the Pipe Nebula. Moreover, we use the derived C¹⁸O central velocities to differentiate between single cores with internal structure and blends of two or more physically distinct cores, superposed along the same line of sight. We then are able to produce a more robust dense core sample for future follow-up studies and a more reliable CMF than was possible previously. We confirm earlier indications that the CMF for the Pipe Nebula departs from a single power-law-like form with a break or knee at $M \sim 2.7 \pm 1.3 M_{sun}$. Moreover, we also confirm that the CMF exhibits a similar shape to the stellar initial mass function (IMF), but is scaled to higher masses by a factor of ~ 4.5 . We interpret this difference in scaling to be a measure of the star formation efficiency ($22\% \pm 8\%$). This supports earlier suggestions that the stellar IMF may originate more or less directly from the CMF.

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<http://de.arxiv.org/abs/0904.4169>

Uncovering the kiloparsec-scale stellar ring of NGC5128

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We reveal the stellar light emerging from the kiloparsec-scale, ring-like structure of the NGC5128 (Centaurus A) galaxy in unprecedented detail. We use arcsecond-scale resolution near infrared images to create a "dust-free" view of the central region of the galaxy, which we then use to quantify the shape of the revealed structure. At the resolution of

the data, the structure contains several hundreds of discreet, point-like or slightly elongated sources. Typical extinction corrected surface brightness of the structure is $K_S = 16.5$ mag/arcsec², and we estimate the total near infrared luminosity of the structure to be $M = -21$ mag. We use diffraction limited (FWHM resolution of $0.1''$, or 1.6 pc) near infrared data taken with the NACO instrument on VLT to show that the structure decomposes into thousands of separate, mostly point-like sources. According to the tentative photometry, the most luminous sources have $M_K = -12$ mag, naming them red supergiants or relatively low-mass star clusters. We also discuss the large-scale geometry implied by the reddening signatures of dust in our near infrared images.

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<http://www.helsinki.fi/~jtkainul/CenALetter>

2 ABSTRACTS OF RECENT CONFERENCE CONTRIBUTIONS

Resumos de trabalhos apresentados em conferências

Correlations Between X-ray Emission and Accretion Tracers in a COUP Subsample of T Tauri Stars

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Using data from FLAMES-GIRAFFE/VLT in two different bands (optical and infrared) we derived for 60 stars at least one accretion tracer. The accretion tracers used were: CaII infrared triplet, HeI 5875, Na-D and optical veiling. All these stars are from a subsample of COUP; therefore their X-rays properties are well known. In this work we correlate the (COUP) X-ray properties of these classical T Tauri stars with their spectral accretion tracers, finding that there is a correlation between the X-ray hardness ratio and the optical veiling.

SIMBOL-X: FOCUSING ON THE HARD X-RAY UNIVERSE: Proceedings of the 2nd International Simbol-X Symposium. AIP Conference Proceedings, Volume 1126, pp. 373-376 (2009)

<http://link.aip.org/link/?APCPCS/1126/373/1>