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ASIAA

Submillimeter Array Newsletter

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CONTENTS

FROM THE DIRECTOR

Dear SMA Newsletter readers,

The second half of 2026 marks one of the most significant periods of transition for the SMA in recent years. Although the observatory has faced considerable operational challenges and an extended shutdown, this period has created an opportunity to modernize critical infrastructure, address long-standing maintenance needs, and improve the long-term reliability and resilience of the array.

A major focus has been the modernization of the summit infrastructure. The successful installation and commissioning of the new flywheel-based uninterruptible power system now provides clean, conditioned power and improved resilience against outages. The ongoing replacement of the Package Air Conditioning Unit is another critical upgrade that will ensure long-term stability for the observatory.

The first half of 2026 also highlighted the challenges of operating in a harsh, high-altitude environment. Severe winter storms temporarily halted science operations and exposed vulnerabilities in aging summit infrastructure. The current shutdown has therefore become an opportunity to complete deferred maintenance that has accumulated over more than two decades of continuous observations, upgrade aging equipment, and strengthen operational practices.

This newsletter highlights three recent scientific results from SMA observations. The first shows that K4-47 is not a stellar merger remnant but rather an unusual planetary nebula with enhanced isotopic abundances and complex molecular chemistry. The second demonstrates that the galaxy Haro 2 hosts exceptionally massive molecular outflows, likely driven by its intense starburst and shallow gravitational potential. The third showcases the SMA as a "chemical workhorse," demonstrating that CS is a sensitive tracer of X-ray-driven chemistry in protoplanetary disks, also highlighting the SMA's unique strength in efficiently observing multiple molecular transitions.

One of the year's most exciting technical developments was the successful deployment of the SMA's rapid-response observing capability. In its first demonstration, the array automatically responded to a NASA General Coordinates Network (GCN) alert and began observing GRB 260127A just 12.6 minutes after its detection by *Swift*, establishing a powerful new capability for time-domain astronomy.

The SMA also reached an important milestone in its wideband upgrade program with the successful commissioning of the third wSMA receiver. Science validation will follow once the array resumes operations, while installation and commissioning of the fourth wSMA receiver are planned during the current shutdown.

While 2026 has been an unusually demanding year operationally, it is also laying the foundation for the SMA's next chapter. The observatory is positioning itself to resume science operations with greater reliability, efficiency, and an even stronger platform for future scientific discovery.

Ranjani Srinivasan
Acting Director, Submillimeter Array

SMA OBSERVATIONS CLARIFY THE NATURE OF THE UNUSUAL NEBULA K4-47

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Planetary nebulae (PNe) are an important class of astrophysical objects, representing the final evolutionary stage of intermediate-mass (≤ 8 $M_\odot$) stars. PNe are characterised by a white dwarf surrounded by an emission nebula. PNe are important laboratories for the formation of molecules and dust, with some of the most complex molecules detected located within PNe. The SMA has played a key role in the last decades in characterizing the transition of AGB stars into PNe (Bublitz et al. 2023; Patel et al. 2024; Kastner et al. 2025).

The shaping of PNe is a subject of debate (Kwok et al. 2026). PNe are found to have a variety of morphologies, with a significant population of PNe showing aspherical or asymmetrical structures. The shaping of PNe has been associated with binary interactions (De Marco 2009), and the formation of asymmetrical planetary nebulae has also been associated with common envelope evolution (Paczyński 1976; Kwitter & Henry 2022).

The young PN K4-47 is an unusual such example of a chemically rich PN. Our understanding of K4-47 is inhibited by the uncertain distance to the source, with studies reporting values in the range of 3-26.5 kpc (e.g., Corradi et al. 2000). The central heating source is assumed in the literature to be a white dwarf with an effective temperature of 115-130 kK (Gonçalves et al. 2004). K4-47 also features a rich inventory of molecules, some of which are rarely detected in PNe (Edwards et al. 2014; Schmidt & Ziurys 2016, 2017, 2019). K4-47 also exhibits clear isotopic enrichment of ^{13}C and ^{15}N, with isotopologue lines featuring these atoms clearly detected in sub-millimetre spectra (Schmidt & Ziurys 2019). The isotopic enrichment of K4-47 is similar to that seen in the luminous red nova (LRN), CK Vul (Schmidt et al. 2018), which is the remnant of a stellar merger of a red giant and helium white dwarf (Tylenda et al. 2024). This led to the suggestion that K4-47 could be an analogue to CK Vul, and is, in fact, a remnant of a stellar merger rather than a classical PN.

LRNe are the result of stellar mergers of non-compact objects, ranging between protostellar and young stellar objects, and evolved stars such as AGB and red giant stars. They are characterised by an intermediate-luminosity eruption, between that of classical novae and supernovae, before the remnant star cools to low effective temperatures of 2000-3000 K (Tylenda 2005). The cool environment surrounding the merger remnant leads to the efficient formation of molecules and dust, leading to these transients becoming optically faint, but particularly bright at infrared and sub-millimetre wavelengths.

Motivated by the uncertainty in the nature of K4-47, we study the CSE of K4-47 in detail, and attempt to derive physical properties of both the nebula gas and the central star. We present 2019 observations of K4-47 using the SMA, complemented by optical imaging and spectroscopic observations of K4-47 using the Nordic Optical Telescope. The SMA observations spatially resolve the central CSE of K4-47 in the sub-millimetre for the first time with a spatial resolution of 1.7″ at 230 GHz, and detect a total of 20 emission lines from 13 molecular species, including isotopologue lines.

The two strongest lines we detected in our SMA observations, CO (2-1) and H^{13}CN (3-2), exhibit a velocity gradient from

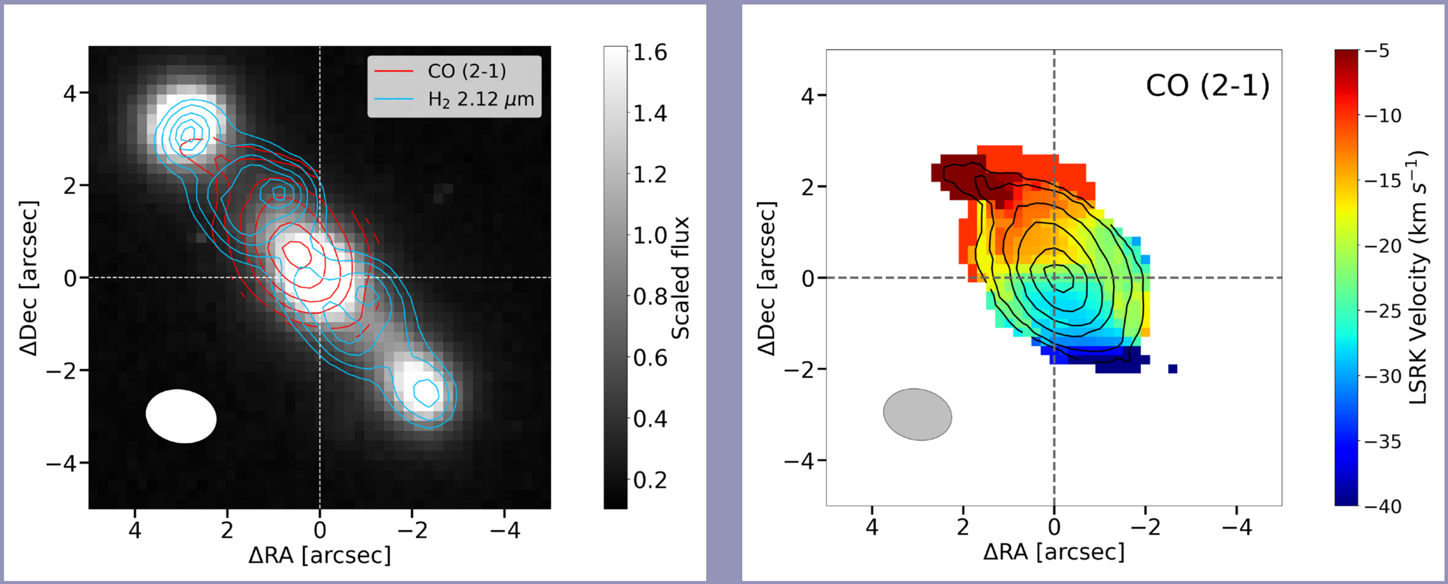

Figure 1: Left panel: Hα image of K4-47, mapped as angular offsets relative to the peak of the $H^{13}CN$ (3-2) emission, with overlaid contours of CO (2-1) (red) and H_2 at 2.12 μm (blue) (Akras et al. 2017). The SMA synthesized beam is shown by the white ellipse in the bottom-left corner. **Right panel:** Integrated velocity map of the CO (2-1) emission. The integrated emission was constructed using emission exceeding 5σ, where σ is the root-mean-square of the background emission. The PA of the velocity gradient is consistent with the PA of the optical outflow seen in the Hα image. The velocity is mapped in the LSRK frame, and the map is in the same offset units as the Hα image.

north-east to south-west (Fig. 1). The CO (2-1) emission traces the bipolar structure observed in Hα, but does not clearly probe the extended, shock-dominated lobes. The average velocity within the central region is -21.1 km/s, with a maximum velocity in the north-east tip of 34.6 km/s, indicating that the molecular CSE has a maximum expansion velocity of 55.7 km/s along a position angle of 41°. The $H^{13}CN$ (3-2) emission has a different position angle of 13°, which may be due to either separate outflow components, or the lack of resolving power from the larger beam size compared to CO.

We also detect K4-47 in continuum emission, with an integrated flux of 30.6 mJy, at an effective frequency of 246 GHz (Fig. 2). The continuum does not show any extended emission or substructure, and the centre of the continuum distribution is slightly offset from the centre of the 5 GHz VLA observations, by ~0.3″. We collected archival photometry of K4-47 at optical and infrared wavelengths, and attempted to fit the resulting SED with a single or combination of blackbodies, resembling different dust components. We found that the peak of the SED was well-fitted with a single dust component with a temperature of 82 K. This gives a total mass range of 0.012-0.89 $M_{\odot}$, for a distance range of 3-26.5 kpc. From comparisons of elemental and isotopic abundances from the literature (Goncalves et al. 2004; Henry et al. 2010) to abundance models of post-AGB stars (Karakas & Lugaro 2016), the progenitor AGB star of K4-47 had a mass of 4-6 $M_{\odot}$. The white dwarf initial-final mass relation (Cummings et al. 2018) indicates that such an AGB star would produce a 1 $M_{\odot}$ white dwarf. This implies a maximum nebula mass of 3-5 $M_{\odot}$, assuming the entire nebula is visible. If we also assume a gas-to-dust ratio of 100, then the maximum distance at which the gas mass of the nebula is consistent is 6 kpc. Therefore, the dust mass is fitted as 0.047 $M_{\odot}$, with an upper limit of 4.74 $M_{\odot}$ for the atomic gas in the nebula.

The SMA observations help us to determine that K4-47 is likely not the remnant of a stellar merger. Upon closer examination, it is not that similar to the merger remnant CK Vul. As well as isotopic enrichment of ^{13}C and ^{15}N, CK Vul also shows isotopic enrichment of 18O (Kaminski et al. 2017). However, no ^{18}O-bearing molecules were discovered in K4-47. Another isotope seen in CK Vul but not in K4-47 is the radioactive isotopologue ^{26}Al, which is found in the form of ^{26}AlF in CK Vul (Kamiński et al. 2018). Finally, the measured dust mass for K4-47 is an order of magnitude higher than for CK Vul, although this is highly uncertain due to the uncertain distance estimate for K4-47. Additional differences, such as the Zanstra temperature for K4-47 indicating a white dwarf of 81 kK, is inconsistent with the measured temperatures of LRNe (2000-3000 K; e.g., Steinmetz et al. 2025). We therefore understand that K4-47 is correctly identified as a PN, although the peculiar properties, such as the isotopic enrichment and

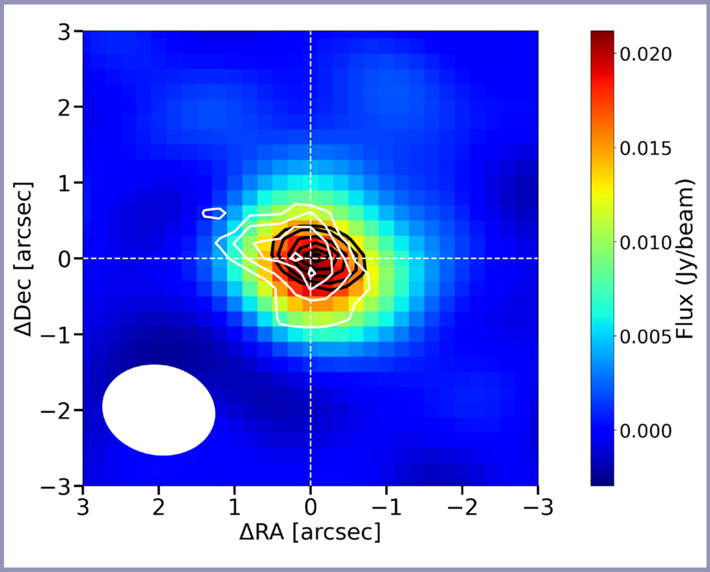

Figure 2: SMA continuum emission at 246 GHz, with black contours indicating 10, 20, 40, 60, 80, and 95% of VLA 5 GHz observations of 1983. White contours show 40, 60, 80, and 95% of the peak flux of the $^{13}C^{17}O$ emission line. The white ellipse indicates the SMA synthesized beam.

abundance of complex molecules, as well as the kinematic structure, make it stand out among the PN population.

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SMA OBSERVES CO(3-2) IN HARO 2: COOL MOLECULAR OUTFLOWS OF A LYα EMITTER

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Haro 2 (Mkn 33, Arp 233, UGC 5720; D ≈ 21 Mpc, v ≈ 1440 km/s) is one of the most luminous blue compact dwarf galaxies in the Local Universe. Haro 2 is immersed in, or has produced, remarkable gas structures: it is the closest known Lyα emitter (Mas-Hesse et al. 2003}, it is surrounded by filaments and shells of Hα (Mendez & Esteban 2000), and it sits in a complex halo of X-ray emission. Our earlier SMA observations of CO(2-1) with ~ 2″ resolution (Beck et al. 2020, Paper I) found a massive molecular outflow coincident with a hot X-ray emitting super-bubble. Where do the molecular

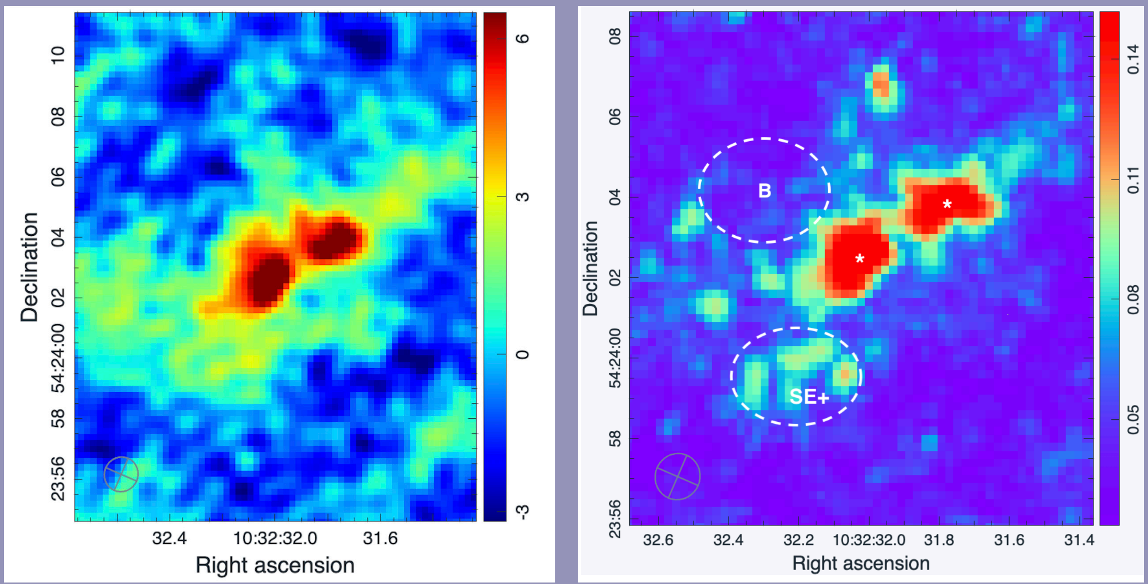

Figure 1: Left: The integrated intensity (moment 0) of the CO(3-2) line on Haro 2. The color bar has units (Jy/beam)(*km*/s). The beam is shown in the lower left, and the noise (1 standard deviation) is ~ 0.6 (Jy/beam)(*km*/s). **Right:** The peak intensity (moment 8) of CO(3-2) on Haro 2. Color bar units are (Jy/beam). The two great starburst clusters are marked with small white stars, the superbubble or outflow region of hot gas is indicated with a white oval and letter 'B' and the south-east extended star formation region with a white oval and 'SE+'. The noise level is ~ 0.01 Jy/beam.

outflows come from? How do they relate to the hot and ionized gas outflows? And how does a small galaxy drive such impressive winds?

These questions motivated us to observe Haro 2 further with the SMA, this time with CO(3-2); these observations probe warmer molecular gas and have spatial resolution almost twice as high. We observed Haro 2 with the Submillimeter Array in both the Extended configuration and the Compact configuration, giving a beam size of about 1″ (≃ 100 pc). The data were binned in velocity to obtain a channel width of 4.2 km/s at the CO(3-2) frequency. Figure 1 shows the integrated and peak intensities of the CO(3-2) line. The left panel of Figure 1 shows the total integrated CO(3-2) line intensity over the full frequency range in a stretch emphasizing weak extended emission; the right panel is the map of peak intensity, which emphasizes clumps.

Cool Molecules and Hot Bubbles

The two great starburst regions (see Figure 1) dominate the CO(3-2) emission. These are giant star clusters or (more probably) groups of star clusters and each has $L_{OB} \sim 10^9\ L_\odot$. The CO(3-2) emission north-west of the galaxy is associated with the expanding superbubble discovered in Paper I. The clumpy emission south-east of the main body of the galaxy is a new discovery of the CO(3-2) maps. This is quite a significant star formation region; the brightest clump is approximately half the intensity of the main southern star cluster. The total CO(3-2) flux of the galaxy is 45 ± 2 Jy km/s in a 5″ radius, and 3/4 of that is concentrated on the bright star clusters. The CO(2-1) is distributed differently, with approximately 2/3 of the CO(2-1) flux in the outflows (Paper I). Taking the ratio of the CO(3-2) to CO(2-1) intensity as a measure of the molecular gas temperature, we find that the clusters and the SE region have temperatures typical of compact star formation sources where the gas is heated by stellar radiation, while the outflow gas is significantly cooler.

How does a cool molecular outflow coincide with a superbubble of hot gas with X-ray temperature 1.77 ± 0.19 x 10^7 K (Summers et al. 2001)? We think the most probable mechanism is that winds of the great star clusters have entrained and lifted out of the plane some of their surrounding molecular gas; it started off warm but has cooled rapidly. Silich et al. (2023) showed that dense cluster winds can cool from 100's of K to 20 K in a few pc travel.

Outflows in All Directions

Figure 2 displays the first moment (weighted mean velocity) of CO(3-2) in Haro 2. In the main body of the galaxy, the two great starburst clusters are offset in velocity, with the stronger south-east cluster ~ 40 km/s redward of the northern cluster; this agrees with previous work. North-east of the galaxy, the 'superbubble' region appears as 'horns' offset in velocity. Opposite to the superbubble, on the south-west of the galaxy, we see a smaller but definite pair of velocity horns. Finally, a complex velocity gradient in the SE region at the southern tip of the galaxy marks what we believe to be another outflow cone.

The weak extensions opposite to the 'superbubble' on the south and west of the galaxy (in the moment 0 and 8 maps

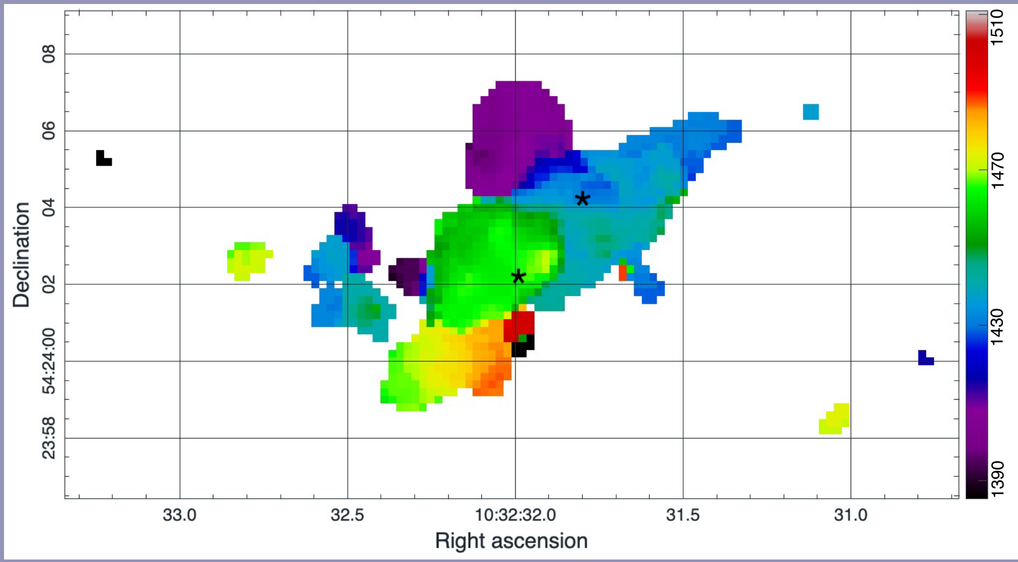

Figure 2: First moment or weighted mean velocity of CO(3-2) in Haro 2. Units of the color bar are velocities in km/s. The data cube was clipped at 3.5 x 10^{-2} Jy/beam ≈ 4σ. The two great starburst clusters are marked with black stars. The outer border of the mapped region corresponds roughly to the 0.8 Jy/beam km/s level of the moment zero map.

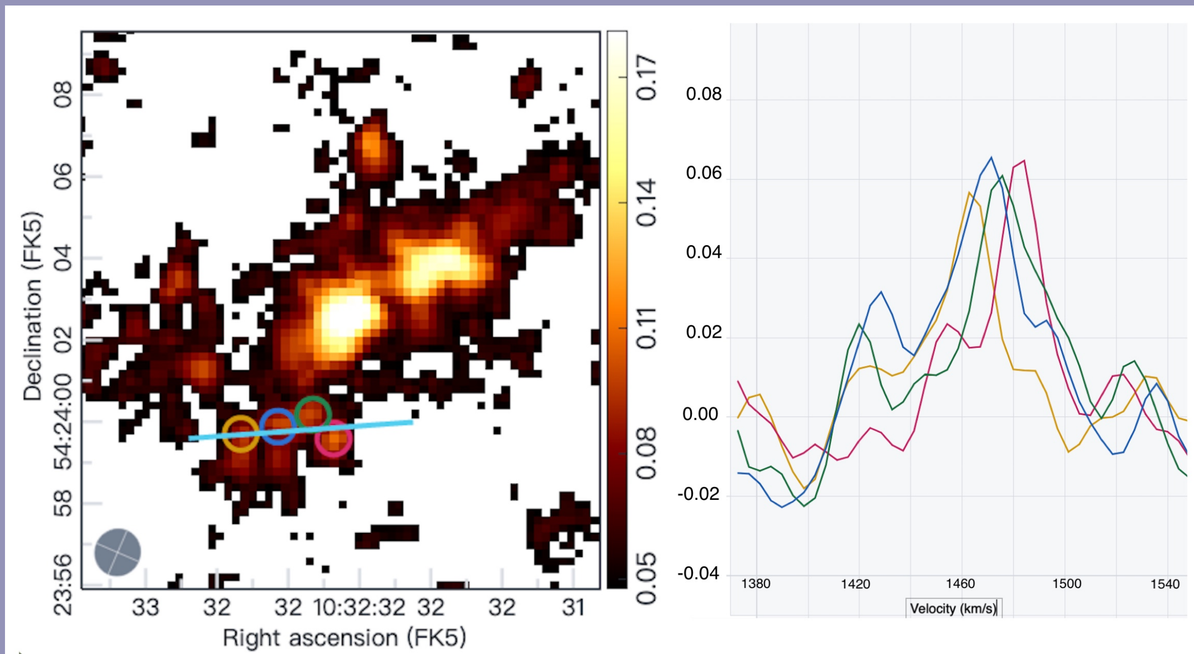

Figure 3: **Left:** The moment 8 map with the positions of the spectral profiles marked with beam-sized circles. The colors of the circles correspond to the colors of the spectral profiles on the right. **Right:** The spectral profiles of the CO(3-2) line in the positions given on the left. The profiles are colored in order of their location as yellow-blue-green-red east to west. The X axis shows velocity in km s−1 and the Y axis intensity in Jy/beam. Uncertainties on the spectra are ≈ 0.01 Jy/beam.

of Figure 1 around RA 10:32:31.6 , Dec 54:24:02) are, we believe, the other (according to the redshift, the far) side of the outflow whose near side is the great 'superbubble', and note that it also present in the CO(2-1) data (see Figures 4 and 5 of Paper I). This side of the outflow is much weaker and smaller in area than the other side. This is the opposite of the ionized gas outflows (Lyα and Hα) which are strong and extended in the SW and are not seen NE. The CO data suggest that the SW region is mostly filled with ionized gas so the molecular component is limited only to a region very close to the galaxy. Figure 2 also shows an expansion or outflow signature and a velocity gradient from west to east across the SE region, and the CO(3-2) line profile in this region, which Figure 3 shows in representative positions, has double peaks that shift over 45 km/s from west to east. All these spatially distinct velocity features suggest an outflow over a ~45 km/s range west-east, with centroid at velocity of 1480 km/s.

Why is this feature not apparent in the CO(2-1) data? The SE cone is only ~ 3" from edge to edge, too close to the 2" resolution of the CO(2-1) maps; another factor is that the molecular gas in the SE is warm and CO(3-2) is strong relative to the CO(2-1). The SE region has other markers of star formation, including "scruffy" emission in Hα, 814 nm, and infrared images and extended weak thermal radio. This region of moderate star formation activity has a few small star clusters with only about 20% the luminosity of those in the main body of the galaxy; it is remarkable that it can drive this observable outflow.

Massive Outflows from a Low-Mass Galaxy

The SMA CO(3-2) maps have refined the picture of molecular structures near and on Haro 2. We see filaments and outflows extending in all directions from the galaxy. The puzzle of Haro 2 is how a relatively modest starburst can host so much outflow activity. The molecular outflows have about 10 times the mass of the ionized (Lequeux et al. 1995), and there is at least as much molecular gas in the outflows (~10^8 $M_\odot$) as in the giant starforming clouds. Haro 2 has total infrared luminosity only ~7 x 10^9 $L_\odot$ (Beck et al. 2000) and total stellar mass ~10^9 $M_\odot$ (Loose, Hans-Hermann & Thuan, Trinh X. 1986) but its outflows have molecular mass comparable to or greater than that in much brighter starbursts such as NGC 253 (Bollato et al. 2013).

We believe that the outflows in Haro 2 stand out because its starburst is extremely strong *compared to the stellar mass of the galaxy*. From what Fluetsch et al. (2019) see in 45 Local Universe outflows, Haro 2 has mass outflow rate consistent with its ~9.9 × 10^{-1} $M_\odot$/yr star formation rate. However Haro 2 has a total stellar mass (~10^9 $M_\odot$ (Loose, Hans-Hermann & Thuan, Trinh X. 1986)) that is at least a factor of 10 less than any of the Fluetsch et al. (2019) sample, and its ratio of star formation rate to total stellar mass at least a factor of 10 higher.

We suggest that the starburst in Haro 2 has developed unusually intense and extended outflows because its low total mass, and thus its shallow gravitational well, makes it easier for the stellar winds to expel matter to large distances. This picture naturally raises more questions. What triggered this unusually strong and extended starburst? Why is the star formation activity in Haro 2 so widespread through the whole galaxy, so that even the faint SE region can drive an outflow? Atomic hydrogen observations are now underway that may address these questions by revealing the interaction or merger history of Haro 2 and tracing the neutral gas structures into which the outflows are expanding. Haro 2 is proving to be an excellent laboratory for detailed study of galactic gas flows.

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X-RAYS ILLUMINATE SULFUR CHEMISTRY IN PLANET-FORMING DISKS

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A recent SMA multiline survey of carbon monosulfide in 12 protoplanetary disks shows that high-energy radiation from young stars can help set the volatile sulfur reservoir available to forming planets.

Sulfur is a small ingredient with outsized consequences. In disks around young stars, it can be locked in refractory minerals, hidden in ices, or carried by molecules in the gas (Semenov et al. 2018; Le Gal et al. 2021). Which form dominates matters for the composition of planetesimals and atmospheres, and ultimately for the chemistry available to young planets (Williams et al. 2025; Law et al. 2025; Waggoner & Cleeves 2022). Yet, sulfur remains one of the least constrained major volatile elements in planet-forming disks. Many species are faint or difficult to detect, and only a few disks have been surveyed in enough sulfur-bearing molecular lines to measure excitation conditions rather than relying on assumptions.

Carbon monosulfide, CS, offers a practical way forward. It is the most commonly detected sulfur-bearing molecule in disks and is expected to be one of the dominant gas-phase sulfur carriers at radii beyond the water snow line (Le Gal et al. 2019, 2021; Phuong et al. 2021). Our new study (Law et al. 2026) therefore asked a deceptively simple question: if CS is widely available to observers, what does it actually trace? The answer requires more than one line. A single CS transition

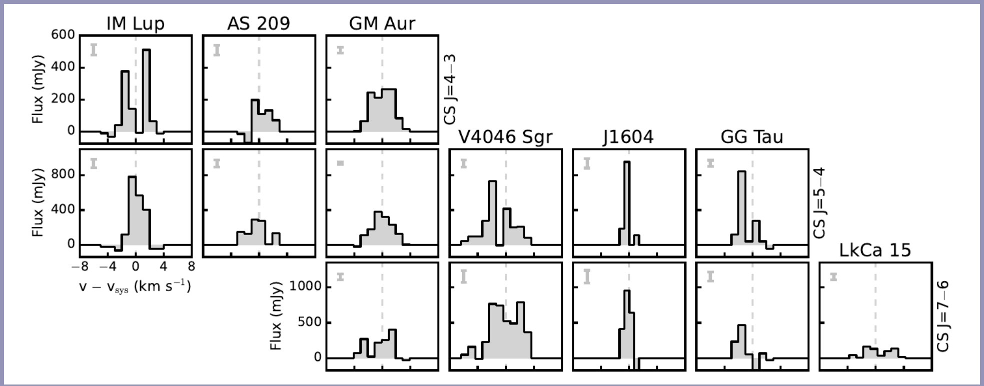

Figure 1: Disk-integrated spectra of CS J=4-3, J=5-4, and J=7-6 obtained with the SMA in the IM Lup, AS 209, GM Aur, V4046 Sgr, J1604, GG Tau, and LkCa 15 disks. The broad spectral coverage of the SMA enabled simultaneous access to several CS lines, providing the leverage needed to constrain disk-averaged excitation. Adapted from Law et al. (2026).

can identify if and where the molecule is present, but multiple transitions are needed to determine its excitation conditions and whether differences from disk to disk reflect chemistry, temperature, or optical-depth effects.

Our survey combined new and archival observations from the SMA, ALMA, and NOEMA of 12 well-studied protoplanetary disks, including several disks from the MAPS ALMA Large Program (Öberg et al. 2021). The sample spans stellar spectral types from M to A, includes full and transition disks, and contains systems with rings, gaps, spiral arms, and central cavities (Law et al. 2026). It is not intended as an unbiased census; rather, it takes advantage of bright, nearby disks with extensive prior characterization. That choice makes it especially powerful for comparing CS against known stellar and disk properties.

Using the SMA as a chemical workhorse

Two SMA programs supplied much of the new observational material. A 2020-2021 observational program observed the disks around IM Lup, GM Aur, AS 209, HD 163296, and MWC 480 with tunings selected to cover CS J=4-3 and J=5-4. A 2023 observational program observed the GM Aur, GG Tau, LkCa 15, V4046 Sgr, and J1604 disks with the upgraded SWARM correlator, whose 48 GHz bandwidth simultaneously covered CS J=5-4 and J=7-6 (Law et al. 2026). In total, our study reports 14 new SMA CS line detections across seven disks (Figure 1), plus a new ALMA detection of CS J=4-3 toward MWC 480. Combining these measurements with archival ALMA and NOEMA data produced a 12-disk sample in which most sources have two to four CS lines.

This multi-instrument approach highlights a particular strength of the SMA. The lines themselves are not exotic, but the ability to cover multiple transitions efficiently is what turns a detection survey into a physical diagnostic. Integrated spectra were extracted with Keplerian masks matched to each disk geometry, and line fluxes were measured consistently across the sample. The resulting fluxes span a wide range from faint low-J emission in some Herbig disks to bright high-J emission in V4046 Sgr. Higher-J transitions are generally stronger, but the key result is not simply line brightness, it is what these line ratios imply about the underlying gas conditions.

A surprisingly uniform CS reservoir

To translate line fluxes into physical conditions, we used a rotational-diagram analysis, including optical-depth corrections and calibration uncertainties, following the standard approach of Goldsmith & Langer (1999). Across the sample, the disk-averaged CS rotational temperatures fall mostly between about 10 and 40 K, with a median near 20 K. Column densities span only about one order of magnitude, from 10^{12} to 10^{13} cm^{-2}, with a median near 5 x 10^{12} cm^{-2} (Figure 2). These values are chemically suggestive: CS remains abundant in

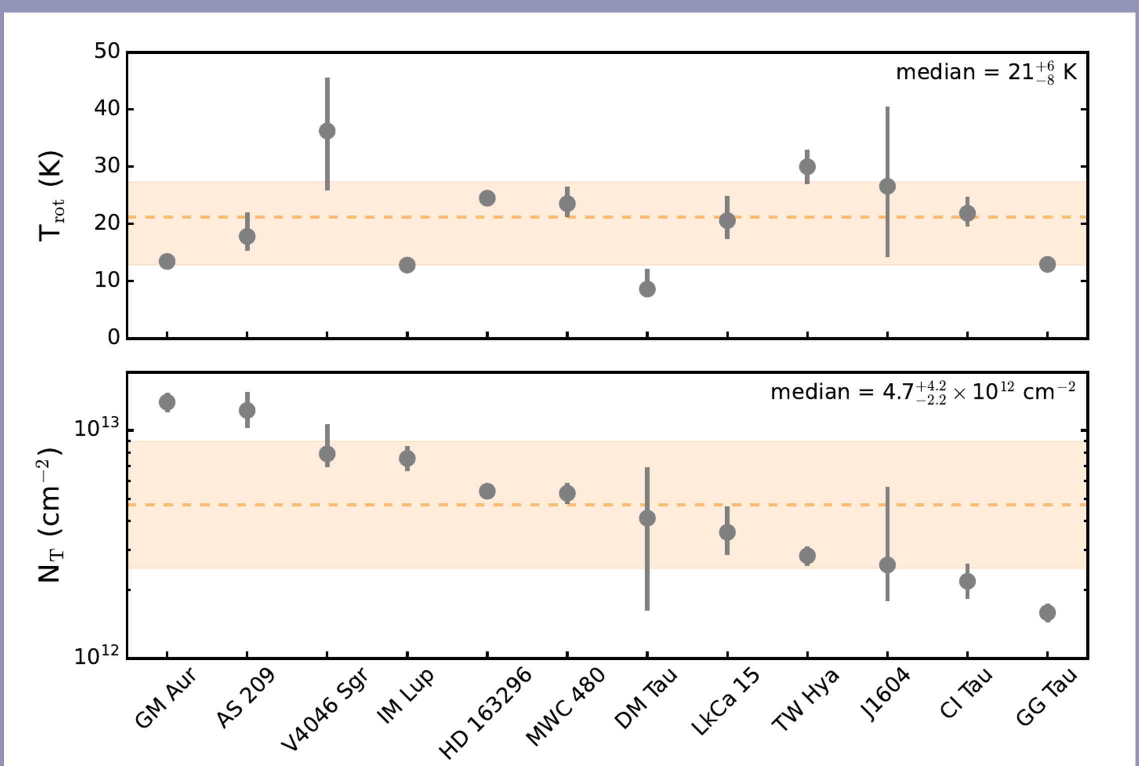

Figure 2: CS rotational temperatures **(top)** and column densities **(bottom)** for the disk sample. Despite the diversity of stellar hosts and dust morphologies, CS column densities vary by only about an order of magnitude. Adapted from Law et al. (2026).

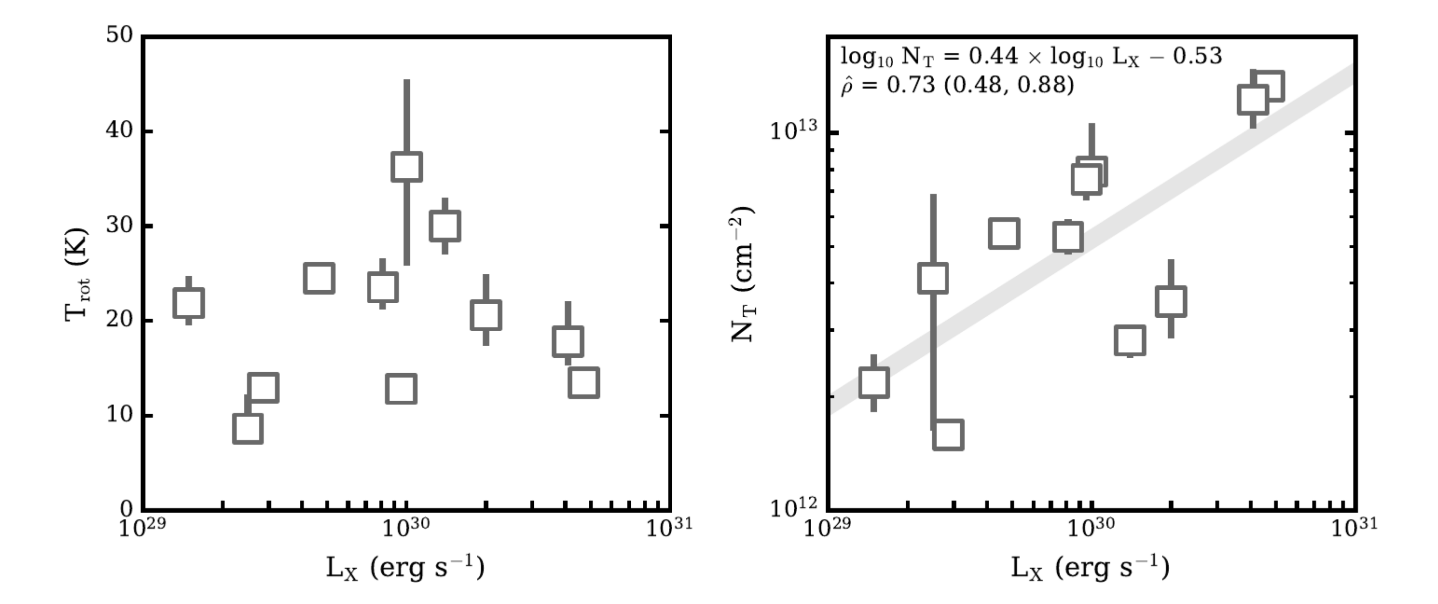

Figure 3: CS rotational temperature **(left)** and column density **(right)** versus stellar X-ray luminosity. Temperature shows no clear trend, while column density increases with X-ray luminosity. The grey line marks the best-fit relation for N_T versus L_X. Adapted from Law et al. (2026).

the outer molecular disk layers and does not disappear simply because the emitting region is cold.

The modest spread is notable because the sources themselves are diverse. The sample includes Solar-type T Tauri disks, two Herbig disks, several transition disks, and circumbinary systems. If CS chemistry were governed mainly by global disk structure, stellar luminosity, or the total amount of millimeter dust, the survey might have revealed strong trends with those quantities. Instead, we find a surprisingly uniform CS-reservoir, broadly consistent with earlier multiline CS studies of individual disks (Teague et al. 2018; Le Gal et al. 2019, 2021). Transition disks and full disks are not cleanly separated in either temperature or column density.

However, there are two important nuances. First, CS J=5-4 fluxes do increase with stellar mass and luminosity among low-mass and Solar-type T Tauri systems, but Herbig disks show lower or more varied fluxes. This may reflect stronger UV photodissociation or different carbon chemistry in warmer disks. Second, CS rotational temperature decreases with increasing millimeter dust disk size. That trend suggests active CS chemistry in large, cool disks and implies that freeze-out alone is not the dominant control on the observable CS reservoir. The abundance of CS seems less tied to bulk disk architecture than to the ionization and chemical state of the disk surface layers.

The X-ray connection

The most striking result emerges when comparing CS column densities with stellar X-ray luminosities (Figure 3). The stellar hosts span nearly two orders of magnitude in X-ray luminosity, from roughly 10^{29} to 5 x 10^{30} erg s^{-1}. While rotational temperature shows no clear dependence on X-rays, the column density does, as disks around more X-ray luminous stars tend to have larger CS columns (Law et al. 2026).

This is chemically intriguing because previous models that explored the impact of X-rays predicted the opposite trend over a similar luminosity range (Semenov et al. 2018). In our study, we propose an interpretation in which X-rays increase the supply of ions that participate in CS formation. X-ray irradiation can enhance He+, which destroys CO and liberates carbon into forms that can feed sulfur chemistry. It can also boost S+, CS+, and HCS+, key intermediates in ion-neutral reaction networks (Aikawa & Herbst 1999; Semenov et al. 2018). In this picture, CS is not just a passive inventory tag for sulfur but is a response to the high-energy environment of the disk surface.

The conclusion is not that CS fails as a sulfur tracer, but that it must be used carefully. CS column density may reflect both the underlying volatile sulfur budget and the level of high-energy irradiation. If two disks have different CS emission, the difference may not simply mean that one disk contains more sulfur; it may mean that X-rays are better at unlocking the chemistry that places sulfur into observable CS. That distinction matters for attempts to connect disk chemistry to planet composition.

What this means for planet formation

Sulfur chemistry is linked to prebiotic pathways and to emerging measurements of sulfur-bearing molecules in exoplanet atmospheres. The Law et al. (2026) survey thus provides an important bridge between disk chemistry and planetary chemistry. It shows that multiline submillimeter observations can turn a commonly detected molecule into a diagnostic of ionization, irradiation, and volatile elemental reservoirs. It also points to X-rays as a potentially decisive environmental parameter during the epoch when disks assemble planet-forming material.

Our study also sets a clear observational agenda. Spatially-resolved CS observations are needed to determine where within disks the X-ray connection is strongest and whether local features - such as rings, gaps, or embedded planets - alter the chemistry. Larger and more demographically-complete samples will also be needed to separate stellar-type effects from irradiation effects (Law et al. 2026).

The broader lesson is that sulfur is not merely missing or present. It is chemically processed by the radiation environment of young stars. By combining broad SMA spectral coverage with sensitive ALMA and NOEMA data, we demonstrate that CS emission carries a memory of X-ray irradiation and offers a new way to probe the ionization-driven chemistry that shapes the volatile inventory of forming planets.

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SMA BOASTS NEW RAPID RESPONSE CAPABILITY

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The SMA team is pleased to report the first successful demonstration of a new technical capability, one which allows the array to rapidly respond to triggers via NASA's General Coordinates Network (GCN). The demonstration, which has since been accepted for publication (Keating et al. 2026), enabled rapid follow-up of GRB 260127A after it was first detected by the Neil Gehrels *Swift* Observatory's Burst Alert Telescope (BAT), with SMA to start observations approximately 4 minutes after the observational trigger was activated, arriving on-source 12.6 minutes after the initial detection by *Swift* (see Figure 1).

The rapid response was made possible by a new software system at SMA called ASTROLABE (Automated Software for Triggering Rapid Observations with Legions of Astrophysically Bright Events), developed by SMA staff. ASTROLABE continuously monitors alerts from GCN, and within seconds of a confirmed detection it can prepare an observing script and notify the SMA operator on duty to interrupt scheduled observations. Although it was originally scoped to process alerts from *Swift*, it is presently being expanded to other facilities that provide alerts via GCN brokers, with other brokers – such as to be used with *Rubin's* Legacy Survey of Space and Time (LSST) – under active evaluation.

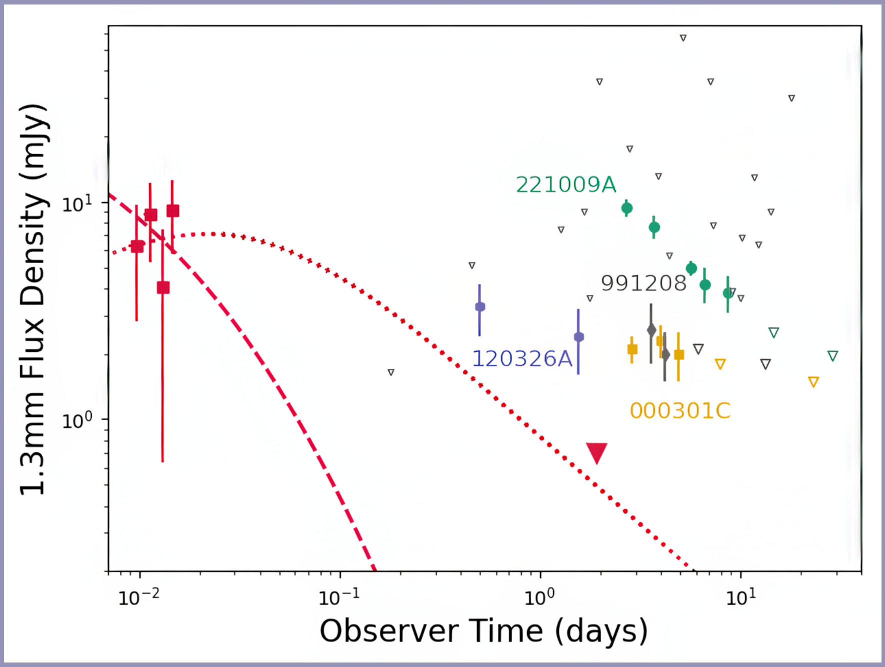

Figure 1: The SMA measurements of GRB 260127A (red points) stand apart from previous follow-up measurements of GRBs, which are typically of order a hundred times further out in time versus what the SMA achieved. Future observations using the newly developed rapid-response mode will help to further push the envelope toward even shorter timescales.

The response time for GRB 260127A represents an order-of-magnitude improvement in response time versus previous observations of GRBs, with another order-of-magnitude improvement expected in the future due with improved software systems and increased streamlining of decision making. These improvements – being deployed alongside the SMA's experimental real-time imaging POLARIS (Peri-Observation Listing of Array Reliability and Interferometric Sensitivity) – are poised to further build upon a strong heritage that SMA has build in time-domain astrophysics.

The SMA team wishes to extend an additional thank you and mahalo to the telescope operators, who assisted with the testing and evaluation of this new mode: K.Laguana, A. Mills, S. Schimpf, R. Smith, N. Smith, and S.-F. Yen.

REFERENCE

- Keating et al. 2026, https://arxiv.org/abs/2604.14297

[2] https://www.alma.cl/~skameno/AMAPOLA/

COMPLETION OF SMA ACTIVE POWER SYSTEM PROJECT

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[1]SMA Hilo

Imua Flywheel Project

SMA Hawai'i is pleased to announce the successful completion of the SMA Active Power System (Flywheel) project.

The newly installed flywheel system uses stored kinetic energy to provide instantaneous short-term backup power and voltage conditioning. Working in conjunction with the facility's backup generator, the system delivers uninterrupted power and helps eliminate the power interruptions and voltage fluctuations that have previously impacted operations.

This important infrastructure upgrade strengthens the reliability and resilience of SMA operations while providing a foundation for future facility improvements. The Active Power System represents a significant investment in the observatory's long-term success, ensuring stable and continuous performance in support of SMA's scientific mission.

This achievement would not have been possible without the dedication, expertise, and collaboration of many individuals across multiple teams. We extend a sincere mahalo to everyone involved for their hard work, flexibility, and commitment to safety throughout the project. The teamwork demonstrated during this effort reflects the strong partnerships that continue to move SMA forward.

With the Active Power System now complete, SMA has entered an interim operational period before work begins on the SMA Package Air Conditioning Unit (PACU) project in the coming weeks. The PACU proj-

ect will include the installation of a new cooling system for the correlator room, a new fire alarm system, a new fire suppression system, and a new building management system.

As we celebrate this important milestone, we also look ahead to the next phase of facility enhancements that will further strengthen Summit operations and support future scientific discoveries.

Mahalo to everyone who helped make this project a success!

ASTRONOMY AND COMMUNITY CONNECTIONS

SMA Hawai'i was proud to support several community outreach and education efforts this year, helping connect local residents with astronomy and the important work taking place on Maunakea.

Astro Day

On May 2, SMA participated in AstroDay at Prince Kūhiō Plaza. Pamela Nehls, Nicholas Smith, and Adam Mills represented SMA at the event, helping visitors learn more about our observatories and the discoveries being made from Maunakea. The event welcomed hundreds of students, families, and community members and provided a fun opportunity for people of all ages to explore astronomy through hands-on activities and conversations with Maunakea Observatories (MKO) staff.

Stargazing

Nicholas Smith and Adam Mills have also generously volunteered their time throughout the year to support community stargazing events at the Maunakea Visitor Information Station (VIS). By helping operate telescopes and sharing their knowledge of the night sky, they have provided residents and visitors with a unique opportunity to experience astronomy firsthand. These monthly MKO Telescope Experience events are highly sought-after and reservation-only programs that allow participants to view celestial objects through observatory-supported telescopes while learning from experienced volunteers. Their willingness to engage with the community helps inspire curiosity and strengthens connections between the observatories and the people of Hawai'i.

Nā Hele Hōkū

As we approach the end of the fiscal year, SMA is also completing work under the Nā Hele Hōkū APAI grant. This project has helped develop educational curriculum and learning resources that connect astronomy, culture, and place-based education. While the grant is coming to a close, we are hopeful that the curriculum, partnerships, and resources developed through the program will continue to support teachers and students throughout the 2026–2027 school year.

Supporting the STARS Advancement Program

SMA Hawai'i was proud to have Nicholas Smith represent our team at a recent STARS Advancement Program donor event on Hawai'i Island.

During the event, Nick helped guests explore the night sky through telescope observations and conversations about astronomy. He assisted with both daytime solar viewing and evening stargazing, providing visitors with a unique opportunity to experience the wonders of the universe firsthand.

The event brought together supporters of the Smithsonian and highlighted the impact of astronomy research, education, and outreach. Through his knowledge and enthusiasm, Nick helped create a memorable experience for guests while showcasing the important work taking place on Maunakea.

Mahalo, Nick, for representing SMA Hawai'i and supporting the STARS Advancement Program. Your efforts helped strengthen connections between our observatories and the community of supporters who make our work possible.

Kama'āina Observatory Experience

SMA also continues to support the Kama'āina Observatory Experience, a program that gives local residents the opportunity to visit the summit observatories and learn about the science, technology, and people behind the discoveries being made on Maunakea. SMA will host participants during the September 5 Kama'āina Observatory Experience, and we look forward to welcoming community members to our facility.

Mahalo to everyone who has contributed their time, knowledge, and enthusiasm to these efforts. Together, we continue to strengthen connections between astronomy, education, and our island community.

PREPARING FOR THE FUTURE OF MAUNAKEA

SMA Acting Director Ranjani Srinivasan has been working closely with the Maunakea Observatory Directors and Representatives of the new Maunakea Stewardship and Oversight Authority (MKSOA) as planning continues for the future management and operations of Maunakea. Discussions have focused on the transition process, operational agreements, and ensuring that observatories remain strong partners in supporting the mountain's scientific, educational, and stewardship goals.

These conversations have provided an opportunity for SMA and the other observatories to share ideas, discuss future contributions, and better understand how we can continue to support the evolving management structure. Topics include operational services, compliance requirements, facility use, education programs, and long-term planning for infrastructure and support services.

While much work remains ahead, the discussions have been productive and encouraging. SMA is committed to being a collaborative partner and looks forward to helping shape a successful future for astronomy, education, stewardship, and community engagement on Maunakea.

Mahalo to Ranjani for representing SMA Hawai'i and helping ensure our voice is part of these important conversations.

SAFETY SPOTLIGHT: THE ROAD TO THE SUMMIT

For SMA Hawai'i employees, one of the greatest workplace hazards is often the journey itself.

Each day, employees travel the Daniel K. Inouye Highway, commonly known as Saddle Road, to reach the summit facilities. While the roadway provides a critical connection across Hawai'i Island, it is also known for rapidly changing weather, dense fog, high winds, heavy rain, low visibility, and long stretches of remote terrain.

Over the past year, several serious accidents and fatalities have occurred along the highway. These tragic incidents serve as an important reminder that safe driving must remain a top priority for everyone who travels the route. Road closures, emergency response activities, and hazardous

weather conditions can occur with little warning and may significantly impact travel to and from the summit.

Unlike a typical commute, summit travel often requires employees to navigate changing weather conditions, elevation changes, darkness, wildlife crossings, and volcanic haze. Our crews regularly face conditions that demand patience, preparation, and constant awareness.

SMA remains committed to a culture of safety and encourages all employees to monitor road and weather conditions, allow extra travel time, avoid distractions while driving, and make conservative decisions when conditions are poor.

The science conducted on Maunakea is important, but nothing is more important than the safety of our employees. Every safe trip to and from the summit is a success.

Please drive safely and watch out for one another.

A YEAR OF UNUSUAL NATURAL EVENTS

2026 has been a reminder of the powerful natural forces that shape life and work on Hawai'i Island. Over the past several months, residents experienced a series of unusual weather and environmental events, including Kona low storms, flooding, volcanic activity, vog and ash impacts, earthquakes, tsunami advisories, high winds, and even a rare volcano tornado, commonly referred to as a “volnado or lavanado”.

These events affected communities across the island and had a direct impact on SMA operations. Heavy rains associated with the Kona low caused damage to antenna infrastructure and portions of the array access roads, requiring repairs, regrading, and ongoing maintenance efforts. Changing weather conditions also created challenges for travel and outdoor work activities.

Volcanic activity brought periods of increased vog and ashfall, which can affect air quality and create health concerns for employees and residents. Many individuals experienced increased allergies, respiratory irritation, and breathing difficulties during periods of poor air quality. At summit elevations, high winds, volcanic haze, and changing environmental conditions can further impact comfort and breathing for those working outdoors.

While each event presented its own challenges, they also highlighted the resilience and adaptability of our staff and community. Employees responded quickly to changing conditions, supported recovery efforts, and continued operations while prioritizing safety.

Living and working on Hawai'i Island means respecting the dynamic environment that surrounds us. From the ocean to the summit, nature continues to remind us of both its beauty and its power.

Mahalo to everyone who helped support our facilities, our staff, and our communities throughout these events. Your dedication, flexibility, and commitment to safety continue to make a difference every day.

SMA 2026B SEMESTER CALL FOR PROPOSALS

The next Call for Standard Observing Proposals with the Submillimeter Array (SMA) is scheduled to be for the 2026B semester, with observing period 16 Nov 2026 - 15 May 2027.

However, as discussed in the Director's cover letter to this issue of the SMA Newsletter, the observatory is currently in an extended shutdown to improve and replace summit infrastructure. As a consequence, the next proposal deadline, semester start date, and observing capabilities are all uncertain at this time.

We will aim to provide updates to the community as soon as possible, and at least 4 weeks before a new proposal deadline, through the SMA email lists and also on the SMA Observer Center (SMAOC) at **http://sma1.sma.hawaii.edu/call.html**.

Up-to-date details on the SMA capabilities and status can be found at **http://sma1.sma.hawaii.edu/status.html**; proposal creation and submission is also done through the SMAOC at **http://sma1.sma.hawaii.edu/proposing.html**. We are happy to answer any questions and to assist in proposal submission; email **sma-propose@cfa.harvard.edu** with inquiries.

David Wilner, SMA TAC Chair

PROPOSAL STATISTICS FOR 2026A

The 2026A SAO proposal deadline was 4 March 2026. SAO received a total of 30 standard proposals divided among science categories as follows:

CATEGORY	PROPOSALS
high mass (OB) star formation, cores	8
protoplanetary, transition, debris disks	6
local galaxies, starbursts, AGN	5
other	3
GRB, SN, high energy	2
low/intermediate mass star formation, cores	2
evolved stars, AGB, PPN	1
galactic center	1
solar system	1
submm/hi-z galaxies	1

In addition to the standard programs, at the end of 2025B there were still three ongoing SAO Large Scale and one ASIAA Key Project programs.

The SMA time allocation committee (TAC) met on April 7 to discuss and assess the proposals. However, soon after the TAC meeting, it was learned that two major infrastructure projects (the summit flywheel installation, and replacement of the Package Air Conditioning Unit that cools critical analog and digital hardware) would strongly impact available observing time during the semester. Though the full scope is not yet known, it is likely that at least 2/3 of 2026A will be adversely affected. Given the uncertainties, the SMA has placed 2026A into an indefinite hold. Until we have clarity on when science observations can resume, we will not allocate observing time to any projects. For transparency, we have passed the TAC narrative and reviews to principal investigators and alerted them of the semester hold.

STANDARD, DDT, FILLER, LARGE SCALE AND KEY PROJECTS OBSERVED DURING 2025B

SMA Semester 2025B started later than expected due to a planned, but ultimately delayed, start to the Package Air Conditioning Unit replacement project. Subsequently, the first month included some programs from the 2025A and 2025B calls. In the end, 2025B encompassed the period Nov 25, 2025 – May 15, 2026; listed below are projects that were at least partially completed during the semester.

EVOLVED STARS, AGB, PPN

2025B-S006 Building an Understanding of the Intrinsic Structures of Planetary Nebulae: SMA CO Mapping of NGC 6072
Joel Kastner, Center for Imaging Science, Rochester Institute of Technology

2025B-S012 Detecting Molecular Gas and High-Velocity Outflows in the Early Post-AGB Binary IRAS 07253-2001
Yun-A Jo, Korea Astronomy and Space Science Institute

GRB, SN, HIGH ENERGY

2022B-S046 POETS: Pursuit of Extragalactic Transients with the SMA [SAO Large Scale Project]
Edo Berger, Harvard University

HIGH MASS (OB) STAR FORMATION, CORES

2025B-S001 A spectral line survey of 50 massive protostars to probe evolutionary and environmental impacts on astrochemistry
Melisse Bonfand, University of Virginia

2025B-S010 Unveiling the magnetized path of massive star formation
Chi Yan Law, INAF - Osservatorio Astrofisico di Arcetri

2025B-S014 Polarized Light from Massive Protoclusters (POLIMAP): Zooming into dense clumps in infrared dark clouds
Chi Yan Law, INAF - Osservatorio Astrofisico di Arcetri

2025B-S023 Mapping the Beginning of the Water Ice Evaporation Phase in a Massive Protostar with the SMA
Maria S. Kirsanova, Institute of Astronomy of the Russian Academy of Sciences

LOCAL GALAXIES, STARBURSTS, AGN

2024B-S057 A complete CO(2-1) Map of M31 with SMA OTF mapping [SAO Large Scale/Technical Development Project]
Eric Koch, Center for Astrophysics | Harvard & Smithsonian

2025A-S042 SMAPOL: SMA Monitoring of AGNs with POLarization
Ioannis Myserlis, Institut de Radioastronomie Milimétrique (IRAM)

2025B-S013 Resolved CO excitation across the Milky-Way Analog Galaxy IC342
Jakob den Brok, Max Planck Institute for Astronomy

2025B-S016 Expanding the SMA Molecular Line Survey of Starburst Galaxy Centers
Jakob den Brok, Max Planck Institute for Astronomy

2025B-S018 SMAPOL: SMA Monitoring of AGNs with POLarization
Ioannis Myserlis, Institut de Radioastronomie Milimétrique (IRAM)

2025B-S021 *COM*pleting SMA observations to study the drastic variation of alpha_CO in M101
Jakob den Brok, Max Planck Institute for Astronomy

LOW/INTERMEDIATE MASS STAR FORMATION, CORES

2025B-S011 Chemistry of Low-Mass Protostars in Irradiated Environments
Beatrice Kulterer, University of Virginia

2025B-S038 DDT: AY191 Spectroscopic and Polarimetric Imaging of the Protobinary Source HOPS 361
Joseph Michail, Center for Astrophysics | Harvard & Smithsonian

OTHER

2025B-S009 Millimeter-wavelength Monitoring of a Galactic Nova
Anna Ho, Cornell

2025B-S022 SMA Observations during a Multi-Wavelength VLBA Campaign of Cygnus X-3
Michael McCollough, Center for Astrophysics | Harvard & Smithsonian

2025B-S024 O18O emission in SNR IC443 B region with the SMA
Shu Liu, National Astronomical Observatories, Chinese Academy of Science

PROTOPLANETARY, TRANSITION, DEBRIS DISKS

2022B-S047 SMA-SPEC: the SMA Survey of Protoplanetary disks to Explore their Chemistry [SAO Large Scale Project]
Karin Öberg, Center for Astrophysics | Harvard & Smithsonian

2025B-S004 The Quest for the Missing Sulfur: OCS in the Oph-IRS 48 Dust Trap
Luke Keyte, Queen Mary University of London

2025B-S008 A Microwave Continuum Survey of Taurus Protoplanetary Disks
Sean Andrews, Center for Astrophysics | Harvard & Smithsonian

2025B-S020 Finding and characterising extreme debris disks: a pilot study
Zoe Parker, University of Leeds

2025B-S031 Detecting Millimeter Emission from Planet-hosting Debris Disks
Carl Ingebretsen, Johns Hopkins University

2025B-S037 Real-time observation of the heating of a disk in outburst [Filler]
Adolfo Carvalho, Center for Astrophysics | Harvard & Smithsonian

2025B-S040 Completing the population of YSO observations in Taurus [Filler]
Joshua Lovell, Center for Astrophysics | Harvard & Smithsonian

SUBMM/HI-Z GALAXIES

2025B-S028 CII Observations of Extremely Luminous and High-Redshift DSFGs
Aaron Hughes, Texas A&M University

2025B-S039 AGAIN?!?!?!?!?!? (870m SED Measurement of EGS13004291) [Filler]
Garrett "Karto" Keating, Center for Astrophysics | Harvard & Smithsonian

RECENT PUBLICATIONS

TITLE: IXPE observations of the blazar Mrk 501 in 2022: a multiwavelength view

AUTHOR: Lisalda, L., Gau, E., Krawczynski, H., Tavecchio, F., Liodakis, I., Gokus, A., Rodriguez Cavero, N., Nowak, M., Negro, M., Middei, R., Perri, M., Puccetti, S., Jorstad, S. G., Agudo, I., Marscher, A. P., Agís-González, B., Berdyugin, A. V., Bernardos, M. I., Blinov, D., Bonnoli, G., Borman, G. A., Bourbah, I. G., Casadio, C., Casanova, V., Castro-Tirado, A. J., Fernández-García, E., García-Comas, M., Grishina, T. S., Hakala, P., Hovatta, T., Hu, Y. D., Husillos, C., Escudero, J., Jormanainen, J., José Aceituno, F., Kagitani, M., Kiehlmann, S., Kontopodis, E., Kopatskaya, E. N., Kouch, P. M., Kravtsov, V., Lähteenmäki, A., Larionova, E. G., Lindfors, E., Mandarakas, N., Marchini, A., Masiero, J. R., Mawet, D., Max-Moerbeck, W., Morozova, D. A., Myserlis, I., Nilsson, K., Panopoulou, G. V., Pearson, T. J., Readhead, A. C. S., Reeves, R., Romanopoulos, S., Sakanoi, T., Salomé, Q., Savchenko, S. S., Skalidis, R., Sota, A., Syrjärinne, I., Tinyanont, S., Tornikoski, M., Troitskaya, Y. V., Troitskiy, I. S., Vasilyev, A. A., Vervelaki, A., Zhovtan, A. V., Antonelli, L. A., Bachetti, M., Baldini, L., Baumgartner, W. H., Bellazzini, R., Bianchi, S., Bongiorno, S. D., Bonino, R., Brez, A., Bucciantini, N., Capitanio, F., Castellano, S., Cavazzuti, E., Chen, C., Ciprini, S., Costa, E., De Rosa, A., Del Monte, E., Di Gesu, L., Di Lalla, N., Di Marco, A., Donnarumma, I., Doroshenko, V., Dovčiak, M., Ehlert, S. R., Enoto, T., Evangelista, Y., Fabiani, S., Ferrazzoli, R., Garcia, J. A., Gunji, S., Gurwell, M., Hayashida, K., Heyl, J., Iwakiri, W., Kaaret, P., Karas, V., Keating, G., Kislat, F., Kitaguchi, T., Kolodziejczak, J. J., La Monaca, F., Latronico, L., Maldera, S., Manfreda, A., Marin, F., Marinucci, A., Marshall, H. L., Massaro, F., Matt, G., Mitsuishi, I., Mizuno, T., Muleri, F., Ng, C., O'Dell, S. L., Omodei, N., Oppedisano, C., Papitto, A., Pavlov, G. G., Peirson, A. L., Pesce-Rollins, M., Petrucci, P., Pilia, M., Possenti, A., Poutanen, J., Ramsey, B. D., Rankin, J., Rao, R., Ratheesh, A., Roberts, O. J., Romani, R. W., Sgrò, C., Slane, P., Soffitta, P., Spandre, G., Swartz, D. A., Tamagawa, T., Taverna, R., Tawara, Y., Tennant, A. F., Thomas, N. E., Tombesi, F., Trois, A., Tsygankov, S. S., Turolla, R., Vink, J., Weisskopf, M. C., Wu, K., Xie, F., Zane, S.

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DOI: 10.1093/mnras/staf1122

TITLE: Very-high-energy gamma-ray intranight variability from BL Lacertae during the extreme flaring state of 2022

AUTHOR: Abe, K., Abe, S., Abhishek, A., Acero, F., Aguasca-Cabot, A., Agudo, I., Alispach, C., Ambrosino, D., Ambrosino, F., Antonelli, L. A., Aramo, C., Arbet-Engels, A., Arcaro, C., Arnesen, T. T. H., Aubert, P., Baktash, A., Balbo, M., Bamba, A., Baquero Larriva, A., Barres de Almeida, U., Barrio, J. A., Barrios Jiménez, L., Batkovic, I., Baxter, J., Becerra González, J., Bernete, J., Berti, A., Bissaldi, E., Blanch, O., Bonnoli, G., Bordas, P., Briscioli, A., Brunelli, G., Buces, J., Bulgarelli, A., Burelli, I., Burmistrov, L., Cardillo, M., Caroff, S., Carosi, A., Carraro, R., Cassol, F., Cerasole, D., Cerviño Cortínez, A., Chai, Y., Chon, G., Chytka, L., Cicciari, G. M., Contreras, J. L., Cortina, J., Costantini, H., Croisonnier, M., Dalchenko, M., D'Amico, G., Da Vela, P., Dazzi, F., De Angelis, A., de Bony de Lavergne, M., Del Burgo, R., Delgado, C., Delgado Mengual, J., della Volpe, D., De Lotto, B., Del Peral, L., de Menezes, R., De Palma, G., de Souza, V., Díaz, C., Di Bella, L., Di Piano, A., Di Pierro, F., Di Tria, R., Di Venere, L., Dominis Prester, D., Donini, A., Dorner, D., Eisenberger, L., Elsässer, D., Emery, G., Feligioni, L., Ferrarotto, F., Fiasson, A., Foffano, L., Fukazawa, Y., Gallozzi, S., Garcia López, R., Garcia Soto, S., Gasbarra, C., Gasparrini, D., Giesbrecht Paiva, J., Giglietto, N., Giordano, F., Godinovic, N., Gradetzke, T., Grau, R., Green, J., Grolleron, G., Gunji, S., Günther, P., Hackfeld, J., Hadasch, D., Hashizume, M., Hassan, T., Hayashi, K., Heckmann, L., Heller, M., Herrera Llorente, J., Hiroshima, N., Hoffmann, D., Horns, D., Houles, J., Hrupec, D., Imazawa, R., Inada, T., Inoue, S., Ioka, K., Iori, M., Itokawa, T., Iuliano, A., Jahanvi, J., Jimenez Martinez, I., Jimenez Quiles, J., Jorge Rodrigo, I., Jurysek, J., Kagaya, M., Karas, V., Katagiri, H., Kerszberg, D., Kiyomoto, T., Kobayashi, Y., Kohri, K., Kornecki, P., Kubo, H., Kushida, J., Lacave, B., Lainez, M., Lamastra, A., Lemoigne, L., Linhoff, M., Lombardi, S., Longo, F., López-Coto, R., López-Oramas, A., Loporchio, S., Lozano Bahilo, J., Lucarelli, F., Luciani, H., Luque-Escamilla, P. L., Makariev, M., Mallamaci, M., Mandat, D., Mannheim, K., Marini, F., Mariotti, M., Marquez, P., Marsella, G., Martí, J., Martinez, O., Martínez, G., Martínez, M., Massa, M., Mazin, D., Méndez-Gallego, J., Menon, S., Mestre Guillen, E., Miceli, D., Miener, T., Miranda, J. M., Molero Gonzalez, M., Molina, E., Montaruli, T., Moralejo, A., Morselli, A., Moya, V., Müller, A. L., Muraishi, H., Nagataki, S., Nakamori, T., Neronov, A., Nieto Castaño, D., Nievas Rosillo, M., Nikolic, L., Noda, K., Novotny, V., Nozaki, S., Ohishi, M., Ohtani, Y., Okumura, A., Orito, R., Orsini, L., Otero-Santos, J., Ottanelli, P., Palatiello, M., Panebianco, G., Paneque, D., Paoletti, R., Paredes, J. M., Pech, M., Pecimotika, M., Peresano, M.

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TITLE: Spectral index evolution of the limb-brightened jet in 3C 84
AUTHOR: Debbrecht, L. C., Paraschos, G. F., Ros, E., Krichbaum, T. P., Bach, U., Gurwell, M. A., Hodgson, J. A., Janssen, M., Kim, J.-Y., Lisakov, M. M., MacDonald, N. R., Nair, D. G., Oh, J., Zensus, J. A.
PUBLICATION: *Astronomy and Astrophysics, 709, A192*
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ABSTRACT: *https://ui.adsabs.harvard.edu/abs/2026A&A...709A.192D*
DOI: 10.1051/0004-6361/202558540

TITLE: The IXPE and multifrequency polarimetric view of the extreme blazars 1ES 1101-232 and RGB J0710+591
AUTHOR: Tavecchio, F., Kim, D. E., Emery, G., Liodakis, I., Agudo, I., Coppi, P., Tagliaferri, G., Di Gesu, L., Sbarrato, T., Ballo, L., Sciaccaluga, A., Ehlert, S. R., Bonnoli, G., José Aceituno, F., Casadio, C., Casanova, V., Donnarumma, I., Escudero, J., Morcuende, D., Otero-Santos, J., Sota, A., Piirola, V., Kouch, P. M., Lindfors, E., Nilsson, K., Myserlis, I., Gurwell, M., Keating, G., Rao, R., Angelakis, E., Kraus, A., Imazawa, R., Sasada, M., Fukazawa, Y., Kawabata, K. S., Uemura, M., Mizuno, T., Nakaoka, T., Tochihara, S., Akai, T., Akitaya, H., Bachev, R., Strigachev, A., Benke, P., Debbrecht, L., Eich, J., Eppel, F., Gokus, A., Hämmerich, S., Heßdörfer, J., Kadler, M., Kim, S., Kirchner, D., Paraschos, G. F., Rösch, F., Schulga, W.
PUBLICATION: *Astronomy and Astrophysics, 709, A150*
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ABSTRACT: *https://ui.adsabs.harvard.edu/abs/2026A&A...709A.150T*
DOI: 10.1051/0004-6361/202558716

TITLE: Where within the 3C 84 jet are γ-rays produced?
AUTHOR: Paraschos, G. F., Liodakis, I., Jorstad, S., Kovalev, Y. Y., Chakraborty, S., Marin, F., Ehlert, S. R., Traianou, E., Debbrecht, L. C., Agudo, I., Barnouin, T., Casey, J. J., Di Gesu, L., Kaaret, P., Kim, D. E., Kislat, F., Ratheesh, A., Saade, M. L., Tombesi, F., Marscher, A., Gómez, J.-L., Pushkarev, A. B., Savolainen, T., Myserlis, I., Gurwell, M., Keating, G., Rao, R., Kang, S., Lee, S.-S., Kim, S., Yeon Cheong, W., Jeong, H.-W., Song, C., Li, S., Nam, M.-S., Álvarez-Ortega, D., Casadio, C., Chen, C.-T., Costa, E., Churazov, E., Ferrazzoli, R., Galanti, G., Khabibullin, I., O'Dell, S. L., Pacciani, L., Roncadelli, M., Roberts, O. J., Soffitta, P., Swartz, D. A., Tavecchio, F., Weisskopf, M. C., Zhuravleva, I.
PUBLICATION: *Astronomy and Astrophysics, 709, A92*
PUBLICATION DATE: 05/2026
ABSTRACT: *https://ui.adsabs.harvard.edu/abs/2026A&A...709A..92P*
DOI: 10.1051/0004-6361/202659250

TITLE: JOYS: Unlocking accretion-rate diagnostics for high-mass protostars using JWST/MIRI HI lines
AUTHOR: Reyes-Reyes, S. D., Beuther, H., van Dishoeck, E. F., Gieser, C., Caratti o Garatti, A., Tychoniec, Ł., Kavanagh, P. J., Klaassen, P. D., Justtanont, K., Francis, L., Le Gouellec, V. J. M., Devaraj, R., Ray, T. P., Chen, Y., Navarro, M. G., Rocha, W. R. M., van Gelder, M. L.
PUBLICATION: *Astronomy and Astrophysics, 709, A13*
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ABSTRACT: *https://ui.adsabs.harvard.edu/abs/2026A&A...709A..13R*
DOI: 10.1051/0004-6361/202558585

TITLE: Multiwavelength quasi-periodic variability of the blazar Ton 599
AUTHOR: Sotnikova, Y. V., Mufakharov, T. V., Volvach, A. E., Vlasyuk, V. V., Khabibullina, M. L., Mikhailov, A. G., An, T., Kudryavtsev, D. O., Kovalev, Y. A., Kovalev, Y. Y., Popkov, A. V., Savchenko, S. S., Erkenov, A. K., Morozova, D. A., Semenova, T. A., Spiridonova, O. I., Kharinov, M. A., Rakhimov, I. A., Andreeva, T. S., Cui, L., Wang, X., Chang, N., Udovitskiy, R. Y., Zhekanis, P. G., Borman, G. A., Grishina, T. S., Kopatskaya, E. N., Larionova, E. G., Troitskiy, I. S., Troitskaya, Y. V., Vasilyev, A. A., Zhovtan, A. V., Kratov, D. V., Volvach, L. N., Shishkina, E. V., Dmytrotsa, A. I., Zharov, V. I.
PUBLICATION: *Monthly Notices of the Royal Astronomical Society, 547, stag333*
PUBLICATION DATE: 04/2026
ABSTRACT: *https://ui.adsabs.harvard.edu/abs/2026MNRAS.547ag333S*
DOI: 10.1093/mnras/stag333

TITLE: Multiple Components and Spectral Evolution of BL Lacertae as Revealed by Multiwavelength Variability and SED Modeling
AUTHOR: Xia, H., Wang, Z., Wu, J., Fang, Y., Du, S.
PUBLICATION: *The Astrophysical Journal, 1001, 32*
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ABSTRACT: *https://ui.adsabs.harvard.edu/abs/2026ApJ..1001...32X*
DOI: 10.3847/1538-4357/ae4dde

TITLE: Ring Asymmetry and Spin in M87*
AUTHOR: Bernshteyn, V., Conroy, N. S., Bauböck, M., Tiede, P., Joshi, A. V., Prather, B. S., Gammie, C. F., The Event Horizon Telescope Collaboration, Akiyama, K., Albentosa-Ruíz, E., Alberdi, A., Alef, W., Algaba, J. C., Anantua, R., Asada, K., Azulay, R., Baczko, A.-K., Ball, D., Bandyopadhyay, B., Barrett, J., Benson, B. A., Bintley, D., Blackburn, L., Blundell, R., Bouman, K. L., Bower, G. C., Bremer, M., Brissenden, R., Britzen, S., Broderick, A. E., Broguiere, D., Bronzwaer, T., Bustamante, S., Carlos, D. F., Carlstrom, J. E., Chael, A., Chan, C.-. kwan ., Chang, D. O., Chatterjee, K., Chen, M.-T., Chen, Y., Cheng, X., Chichura, P., Cho, I., Conway, J. E., Crawford, T. M., Crew, G. B., Cruz-Osorio, A., Cui, Y., Curd, B., Dahale, R., Davelaar, J., De Laurentis, M., Deane, R., Dexter, J., Dhruv, V., Dihingia, I. K., Doeleman, S. S., Dzib, S. A., Emami, R., Falcke, H., Farah, J., Fish, V. L., Fomalont, E., Ford, H. A., Foschi, M., Fraga-Encinas, R., Freeman, W. T., Friberg, P., Fromm, C. M., Fuentes, A., Galison, P., García, R., Gentaz, O., Georgiev, B., Goddi, C., Gold, R., Gómez-Ruiz, A. I., Gómez, J. L., Gu, M., Gurwell, M., Hada, K., Haggard, D., Hesper, R., Heumann, D., Ho, L. C., Ho, P., Honma, M., Huang, C.-W. L., Huang, L., Hughes, D. H., Ikeda, S., Impellizzeri, C. M. V., Inoue, M., Issaoun, S., James, D. J., Jannuzi, B. T., Janssen, M., Jeter, B., Jiang, W., Jiménez-Rosales, A., Johnson, M. D., Jorstad, S., Jones, A. C., Jung, T., Kawashima, T., Keating, G. K., Kettenis, M., Kim, D.-J., Kim, J.-Y., Kim, J., Kim, J., Kino, M., Koay, J. Y., Kocherlakota, P., Kofuji, Y., Koch, P. M., Koyama, S., Kramer, C., Kramer, J. A., Kramer, M., Krichbaum, T. P., Kuo, C.-Y., La Bella, N., Lee, D., Lee, S.-S., Levis, A., Li, S., Li, Z., Lico, R., Lindahl, G., Lindqvist, M., Lisakov, M., Liu, J., Liu, K., Liuzzo, E., Lo, W.-P., Lobanov, A. P., Loinard, L., Lonsdale, C. J., Lowitz, A. E., Lu, R.-S., MacDonald, N. R., Mao, J., Marchili, N., Markoff, S., Marrone, D. P., Marscher, A. P., Martí-Vidal, I., Matsushita, S., Matthews, L. D., Medeiros, L., Menten, K. M., Messias, H., Mizuno, I., Mizuno, Y., Montgomery, J., Moriyama, K., Moscibrodzka, M., Mulaudzi, W., Müller, C., Müller, H., Mus, A., Musoke, G., Myserlis, I., Nagai, H., Nagar, N. M., Nair, D. G., Nakamura, M., Narayanan, G., Natarajan, I., Nathanail, A., Navarro Fuentes, S., Neilsen, J., Ni, C., Nowak, M. A., Okino, H., Olivares Sánchez, H. R., Özel, F., Palumbo, D. C. M., Paraschos, G. F., Park, J., Parsons, H., Patel, N., Pen, U.-L., Pesce, D. W., Piétu, V., Plavin, A., PopStefanija, A., Porth, O., Principe, G., Psaltis, D., Pu, H.-Y., Rahlin, A., Ramakrishnan, V., Rao, R., Rawlings, M. G., Rezzolla, L., Ricarte, A., Ricci, L.

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PUBLICATION DATE: 04/2026
ABSTRACT: *https://ui.adsabs.harvard.edu/abs/2026ApJ..1000..231B*
DOI: 10.3847/1538-4357/ae34af

TITLE: Resolved Dust Emission and CO Isotopologues in Giant Molecular Clouds of the Andromeda Galaxy
AUTHOR: Bosomworth, C., Forbrich, J., Lada, C. J., Petitpas, G.
PUBLICATION: *The Astrophysical Journal, 1000, 215*
PUBLICATION DATE: 04/2026
ABSTRACT: *https://ui.adsabs.harvard.edu/abs/2026ApJ..1000..215B*
DOI: 10.3847/1538-4357/ae448b

TITLE: High-resolution Observations of CO(3—2) in Haro 2: Cool Molecular Outflows of a Lyα Emitter
AUTHOR: Beck, S., Hsieh, P.-Y., Turner, J.
PUBLICATION: *The Astronomical Journal, 171, 199*
PUBLICATION DATE: 04/2026
ABSTRACT: *https://ui.adsabs.harvard.edu/abs/2026AJ....171..199B*
DOI: 10.3847/1538-3881/ae4516

TITLE: Locating the missing large-scale emission in the jet of M87* with short EHT baselines
AUTHOR: Georgiev, B., Tiede, P., von Fellenberg, S. D., Janssen, M., Natarajan, I., Blackburn, L., Park, J., Chavez, E., West, A. T., Moriyama, K., Koay, J. Y., Müller, H., Nair, D. G., Broderick, A. E., Wielgus, M., The Event Horizon Telescope Collaboration, Akiyama, K., Albentosa-Ruíz, E., Alberdi, A., Alef, W., Algaba, J. C., Anantua, R., Asada, K., Azulay, R., Bach, U., Baczko, A.-K., Ball, D., Baloković, M., Bandyopadhyay, B., Barrett, J., Bauböck, M., Benson, B. A., Bintley, D., Blundell, R., Bouman, K. L., Bower, G. C., Bremer, M., Brissenden, R., Britzen, S., Broguiere, D., Bronzwaer, T., Bustamante, S., Carlos, D. F., Carlstrom, J. E., Chael, A., Chan, C.-. kwan ., Chang, D. O., Chatterjee, K., Chatterjee, S., Chen, M.-T., Chen, Y., Cheng, X., Chichura, P., Cho, I., Christian, P., Conroy, N. S., Conway, J. E., Crawford, T. M., Crew, G. B., Cruz-Osorio, A., Cui, Y., Curd, B., Dahale, R., Davelaar, J., De Laurentis, M., Deane, R., Desvignes, G., Dexter, J., Dhruv, V., Dihingia, I. K., Doeleman, S. S., Dzib, S. A., Eatough, R. P., Emami, R., Falcke, H., Farah, J., Fish, V. L., Fomalont, E., Alyson Ford, H., Foschi, M., Fraga-Encinas, R., Freeman, W. T., Friberg, P., Fromm, C. M., Fuentes, A., Galison, P., Gammie, C. F., García, R., Gentaz, O., Goddi, C., Gold, R., Gómez-Ruiz, A. I., Gómez, J. L., Gu, M., Gurwell, M., Hada, K., Haggard, D., Hesper, R., Heumann, D., Ho, L. C., Ho, P., Honma, M., Huang, C.-W. L., Huang, L., Hughes, D. H., Ikeda, S., Violette Impellizzeri, C. M., Inoue, M., Issaoun, S., James, D. J., Jannuzi, B. T., Jeter, B., Jiang, W., Jiménez-Rosales, A., Johnson, M. D., Jorstad, S., Jones, A. C., Joshi, A. V., Jung, T., Karuppusamy, R., Kawashima, T., Keating, G. K., Kettenis, M., Kim, D.-J., Kim, J.-Y., Kim, J., Kim, J., Kino, M., Kocherlakota, P., Kofuji, Y., Koch, P. M., Koyama, S., Kramer, C., Kramer, J. A., Kramer, M., Krichbaum, T. P., Kuo, C.-Y., La Bella, N., Lee, D., Lee, S.-S., Levis, A., Li, Z., Lico, R., Lindahl, G., Lindqvist, M., Lisakov, M., Liu, J., Liu, K., Liuzzo, E., Lo, W.-P., Lobanov, A. P., Loinard, L., Lonsdale, C. J., Lowitz, A. E., Lu, R.-S., MacDonald, N. R., Mao, J., Marchili, N., Markoff, S., Marrone, D. P., Marscher, A. P., Martí-Vidal, I., Matsushita, S., Matthews, L. D., Medeiros, L., Menten, K. M., Mizuno, I., Mizuno, Y., Montgomery, J., Moran, J. M., Moscibrodzka, M., Mulaudzi, W., Müller, C., Mus, A., Musoke, G., Myserlis, I., Nagai, H., Nagar, N. M., Nakamura, M., Narayanan, G., Nathanail, A., Navarro Fuentes, S., Neilsen, J., Ni, C., Nowak, M. A., Oh, J., Okino, H., Olivares Sánchez, H. R., Oyama, T., Özel, F., Palumbo, D. C. M., Paraschos, G. F., Parsons, H., Patel, N., Pen, U.-L., Pesce, D. W., Piétu, V., Plavin, A., PopStefanija, A., Porth, O.
PUBLICATION: *Astronomy and Astrophysics, 709, A26*
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ABSTRACT: *https://ui.adsabs.harvard.edu/abs/2026A&A...709A..26G*
DOI: 10.1051/0004-6361/202557013

TITLE: The fate of the failed supernova candidate M31-2014-DS1
AUTHOR: Beasor, E. R., Smith, N., Pearson, J., Subrayan, B., Berger, E., Sand, D. J., Strader, J.
PUBLICATION: *Monthly Notices of the Royal Astronomical Society, 546, stag052*
PUBLICATION DATE: 03/2026
ABSTRACT: *https://ui.adsabs.harvard.edu/abs/2026MNRAS.546ag052B*
DOI: 10.1093/mnras/stag052

TITLE: First detection of VHE gamma-ray signal from the FSRQ TON 0599
AUTHOR: MAGIC Collaboration, Abe, K., Abe, S., Abhir, J., Abhishek, A., Acciari, V. A., Aguasca-Cabot, A., Agudo, I., Aniello, T., Ansoldi, S., Antonelli, L. A., Arbet Engels, A., Arcaro, C., Asano, K., Babić, A., Barres de Almeida, U., Barrio, J. A., Barrios-Jiménez, L., Batković, I., Baxter, J., González, J. B., Bednarek, W., Bernardini, E., Bernete, J., Berti, A., Besenrieder, J., Bigongiari, C., Biland, A., Blanch, O., Bonnoli, G., Bošnjak, Ž., Bronzini, E., Burelli, I., Campoy-Ordaz, A., Carosi, A., Carosi, R., Carretero-Castrillo, M., Castro-Tirado, A. J., Cerasole, D., Ceribella, G., Chai, Y., Cifuentes, A., Contreras, J. L., Cortina, J., Covino, S., D'Amico, G., da Vela, P., Dazzi, F., de Angelis, A., de Lotto, B., de Menezes, R., Delfino, M., Delgado, J., Delgado Mendez, C., Di Pierro, F., Di Tria, R., Di Venere, L., Dinesh, A., Dominis Prester, D., Donini, A., Dorner, D., Doro, M., Eisenberger, L., Elsaesser, D., Escudero, J., Foffano, L., Font, L., Fröse, S., Fukami, S., Fukazawa, Y., Garczarczyk, M., Gasparyan, S., Gaug, M., Giesbrecht Paiva, J. G., Giglietto, N., Giordano, F., Gliwny, P., Godinović, N., Gradetzke, T., Grau, R., Green, D., Green, J. G., Günther, P., Hadasch, D., Hahn, A., Hassan, T., Heckmann, L., Herrera Llorente, J., Hrupec, D., Imazawa, R., Israyelyan, D., Jiménez Martínez, I., Jiménez Quiles, J., Jormanainen, J., Kankkunen, S., Kerszberg, D., Khachatryan, M., Konrad, J., Kouch, P. M., Kubo, H., Kushida, J., Láinez, M., Lamastra, A., Lindfors, E., Lombardi, S., Longo, F., López-Coto, R., López-Moya, M., López-Oramas, A., Loporchio, S., Lorini, A., Lulić, L., Lyard, E., Majumdar, P., Makariev, M., Maneva, G., Manganaro, M., Mangano, S., Mannheim, K., Mariotti, M., Martínez, M., Maruševec, P., Mas-Aguilar, A., Mazin, D., Menchiari, S., Mender, S., Miceli, D., Miranda, J. M., Mirzoyan, R., Molero González, M., Molina, E., Mondal, H. A., Moralejo, A., Nakamori, T., Nanci, C., Neustroev, V., Nickel, L., Nigro, C., Nikolić, L., Nilsson, K., Nishijima, K., Noda, K., Nozaki, S., Ohtani, Y., Okumura, A., Otero-Santos, J., Pacciani, L., Paiano, S., Paneque, D., Paoletti, R., Paredes, J. M., Peresano, M., Persic, M., Pihet, M., Podobnik, F., Moroni, P. G. P., Prandini, E., Principe, G., Ribó, M., Rico, J., Righi, C., Sahakyan, N., Saito, T., Saturni, F. G., Schmitz, K., Schmuckermaier, F., Schubert, J. L., Sciaccaluga, A., Silvestri, G., Sitarek, J., Sobczynska, D., Stamerra, A., Strišković, J., Suda, Y., Tajima, H., Takahashi, M., Takeishi, R., Tavecchio, F., Temnikov, P., Terauchi, K., Terzić, T., Teshima, M., Tutone, A., Ubach, S., van Scherpenberg, J., Ventura, S., Verna, G., Viale, I., Vigliano, A., Vigorito, C. F., Vitale, V., Vovk, I., Walter, R., Wersig, F., Will, M., Yamamoto, T., MWL Collaborators, Acosta-Pulido, J. A., Borman, G. A., Boschin, W.
PUBLICATION: *Monthly Notices of the Royal Astronomical Society, 546, stag032*
PUBLICATION DATE: 03/2026
ABSTRACT: *https://ui.adsabs.harvard.edu/abs/2026MNRAS.546ag032M*
DOI: 10.1093/mnras/stag032

TITLE: The Chemical Diversity of Giant-planet Nurseries as Revealed by ALMA
AUTHOR: Booth, A. S., Calahan, J., Temmink, M., Wölfer, L., Pegues, J., Law, C. J., Evans, L., Leemker, M., Notsu, S., Öberg, K., Walsh, C., van Dishoeck, E. F.
PUBLICATION: *The Astronomical Journal, 171, 128*
PUBLICATION DATE: 03/2026
ABSTRACT: *https://ui.adsabs.harvard.edu/abs/2026AJ....171..128B*
DOI: 10.3847/1538-3881/ae286b

TITLE: Observations of the temporal evolution of Saturn's stratosphere following the Great Storm of 2010 – 2011: II. Latitudinal distribution of CO and stratospheric winds
AUTHOR: Cavalié, T., Moreno, R., Lefour, C., Benmahi, B., Fouchet, T., Lellouch, E., Ducreux, É., Gurwell, M., Gueth, F., Fletcher, L. N., Bardet, D.
PUBLICATION: *Astronomy and Astrophysics, 707, A240*
PUBLICATION DATE: 03/2026
ABSTRACT: *https://ui.adsabs.harvard.edu/abs/2026A&A...707A.240C*
DOI: 10.1051/0004-6361/202557032

TITLE: A long-term multiwavelength study of the flat spectrum radio quasar OP 313
AUTHOR: Bartolini, C., Lindfors, E., Tramacere, A., Giroletti, M., Cerasole, D., Agudo, I., Angelakis, E., Bissaldi, E., Casaburo, F., D'Ammando, F., Di Venere, L., Fallah Ramazani, V., Giacchino, F., Giordano, F., Gurwell, M., Jormanainen, J., Jorstad, S., Keating, G., Kouch, P. M., Kraus, A., Lähteenmäki, A., Loporchio, S., Marchili, N., Marscher, A., Myserlis, I., Rao, R., Righini, S., Tornikoski, M.
PUBLICATION: *Astronomy and Astrophysics, 707, A136*
PUBLICATION DATE: 03/2026
ABSTRACT: *https://ui.adsabs.harvard.edu/abs/2026A&A...707A.136B*
DOI: 10.1051/0004-6361/202556612

TITLE: Continued Rapid Radio Brightening of the Tidal Disruption Event AT2018hyz
AUTHOR: Cendes, Y., Berger, E., Beniamini, P., Gill, R., Matsumoto, T., Alexander, K. D., Bietenholz, M. F., Hajela, A., Christy, C. T., Chornock, R., Gomez, S., Gurwell, M. A., Keating, G. K., Laskar, T., Margutti, R., Rao, R., Velez, N., Wieringa, M. H.
PUBLICATION: *The Astrophysical Journal, 998, 111*
PUBLICATION DATE: 02/2026
ABSTRACT: *https://ui.adsabs.harvard.edu/abs/2026ApJ...998..111C*
DOI: 10.3847/1538-4357/ae286d

TITLE: First Mid-infrared Detection and Modeling of a Flare from Sgr A*. II. Mid-infrared Spectral Energy Distribution and Millimeter Polarimetry
AUTHOR: Michail, J. M., von Fellenberg, S. D., Keating, G. K., Rao, R., Roychowdhury, T., Willner, S. P., Ford, N. M., Haggard, D., Markoff, S., Philippov, A., Ripperda, B., Sanchez-Maes, S., Sumners, Z., Witzel, G., Balakrishnan, M., Chandra, S., Hada, K., Garcia Marin, M., Gurwell, M. A., Fazio, G. G., Hora, J. L., Seefeldt-Gail, B., Smith, H. A.
PUBLICATION: *The Astrophysical Journal, 997, 282*
PUBLICATION DATE: 02/2026
ABSTRACT: *https://ui.adsabs.harvard.edu/abs/2026ApJ...997..282M*
DOI: 10.3847/1538-4357/ae25ef

TITLE: A Millimeter Methanol Maser Ring Tracing the Deceleration of the Heat Wave Powered by the Massive Protostellar Accretion Outburst in G358.93—0.03 MM1
AUTHOR: Hunter, T. R., Brogan, C. L., MacLeod, G. C., Cyganowski, C. J., Burns, R. A., McGuire, B. A.
PUBLICATION: *The Astrophysical Journal, 997, L21*
PUBLICATION DATE: 01/2026
ABSTRACT: *https://ui.adsabs.harvard.edu/abs/2026ApJ...997L..21H*
DOI: 10.3847/2041-8213/ae32f6

TITLE: Probing the Era of Giant Collisions: Millimeter Observations of the HD 166191 System
AUTHOR: Worthen, K., Chen, C. H., Hughes, A. M., Johnson, B. C., Rebollido, I., Garcia, D. E., Kittling, J., Lisse, C. M.
PUBLICATION: *The Astrophysical Journal, 997, 94*
PUBLICATION DATE: 01/2026
ABSTRACT: *https://ui.adsabs.harvard.edu/abs/2026ApJ...997...94W*
DOI: 10.3847/1538-4357/ae201a

TITLE: A Submillimeter Survey of CS Excitation in Protoplanetary Disks: Evidence of X-Ray-driven Sulfur Chemistry
AUTHOR: Law, C. J., Le Gal, R., Öberg, K. I., Zhang, K., Aikawa, Y., Andrews, S. M., Bae, J., Booth, A. S., Cataldi, G., Cleeves, L. I., Long, F., Ménard, F., Qi, C., Teague, R., Wilner, D. J.
PUBLICATION: *The Astrophysical Journal, 997, 91*
PUBLICATION DATE: 01/2026
ABSTRACT: *https://ui.adsabs.harvard.edu/abs/2026ApJ...997...91L*
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TITLE: Probing jet base emission of M87* with the 2021 Event Horizon Telescope observations

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The Submillimeter Array (SMA) is a pioneering radio-interferometer dedicated to a broad range of astronomical studies including finding protostellar disks and outflows; evolved stars; the Galactic Center and AGN; normal and luminous galaxies; and the solar system. Located on Maunakea, Hawaii, the SMA is a collaboration between the Smithsonian Astrophysical Observatory and the Academia Sinica Institute of Astronomy and Astrophysics.

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