Yoshihide Yamato

I am a Ph.D. student at the Department of Astronomy, Graduate School of Science, the University of Tokyo. My research interests focus on understanding the physics and chemistry during star and planet formation, with a special interest in the chemical evolution traced by isotopic chemistry, using radio observations with Atacama Large Millimeter/submillimeter Array (ALMA) and Karl G. Jansky Very Large Array (VLA).

Contact Information

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Work Experience

2023 – present	Japan Society for the Promotion of Science (JSPS) Research Fellowship for Young Scientists
2020 – 2023	Research Assistant of International Graduate Program for Excellence in Earth-Space Science (IGPEES)

Education

2022 – present	Ph.D. course in Astronomy, The University of Tokyo Supervisor: Yuri Aikawa
2022	Masters of Science in Astronomy, The University of Tokyo Supervisor: Yuri Aikawa
2020	Bachelor of Science in Astronomy, The University of Tokyo

Awards

2022	The Graduate School Research Award for Masters Thesis
2022	Excellence Award for Qualifying Examination of IGPEES

Grants

2023 – 2025	Grants-in-Aid for JSPS Fellows (23KJ0636; 1.8M JPY) *Physical and chemical structure of young planet-forming disks revealed by ALMA high-resolution observations*

Refereed Publications with Significant Contributions (Including as a Lead Author)

[5] *Chemistry of Complex Organic Molecules in the V883 Ori Disk Revealed by ALMA Band 3 Observations*, **Yamato, Y.**, Notsu, S., Aikawa, Y., et al. 2023, arXiv e-prints, arXiv:2312.01300, doi: 10.48550/arXiv.2312.01300

[4] *Early Planet Formation in Embedded Disks (eDisk). IV. The Ringed and Warped Structure of the Disk around the Class I Protostar L1489 IRS*, **Yamato, Y.**, Aikawa, Y., Ohashi, N., et al. 2023, ApJ, 951, 11, doi: 10.3847/1538-4357/accd71

[3] *The First Interferometric Measurements of NH_2D/NH_3 Ratio in Hot Corinos*, **Yamato, Y.**, Furuya, K., Aikawa, Y., et al. 2022, ApJ, 941, 75, doi: 10.3847/1538-4357/ac9ea5

[2] *Molecules with ALMA at Planet-forming Scales (MAPS). X. Studying Deuteration at High Angular Resolution toward Protoplanetary Disks*, Cataldi, G., **Yamato, Y.**, Aikawa, Y., et al. 2021, ApJS, 257, 10, doi: 10.3847/1538-4365/ac143d

[1] *Molecules with ALMA at Planet-forming Scales (MAPS). XIII. HCO^+ and Disk Ionization Structure*, Aikawa, Y., Cataldi, G., **Yamato, Y.**, et al. 2021, ApJS, 257, 13, doi: 10.3847/1538-4365/ac143c

CO-AUTHORED REFEREED PUBLICATIONS

[19] *Early Planet Formation in Embedded Disks (eDisk). I. Overview of the Program and First Results*, Ohashi, N., Tobin, J. J., Jørgensen, J. K., et al. 2023, ApJ, 951, 8, doi: 10.3847/1538-4357/acd384

[18] *Early Planet Formation in Embedded Disks (eDisk). II. Limited Dust Settling and Prominent Snow Surfaces in the Edge-on Class I Disk IRAS 04302+2247*, Lin, Z.-Y. D., Li, Z.-Y., Tobin, J. J., et al. 2023, ApJ, 951, 9, doi: 10.3847/1538-4357/acd5c9

[17] *Early Planet Formation in Embedded Disks (eDisk). VII. Keplerian Disk, Disk Substructure, and Accretion Streamers in the Class 0 Protostar IRAS 16544-1604 in CB 68*, Kido, M., Takakuwa, S., Saigo, K., et al. 2023, ApJ, 953, 190, doi: 10.3847/1538-4357/acdd7a

[16] *Early Planet Formation in Embedded Disks (eDisk). VIII. A Small Protostellar Disk around the Extremely Low Mass and Young Class 0 Protostar IRAS 15398-3359*, Thieme, T. J., Lai, S.-P., Ohashi, N., et al. 2023, ApJ, 958, 60, doi: 10.3847/1538-4357/ad003a

[15] *Early Planet Formation in Embedded Disks (eDisk). XII. Accretion Streamers, Protoplanetary Disk, and Outflow in the Class I Source Oph IRS 63*, Flores, C., Ohashi, N., Tobin, J. J., et al. 2023, ApJ, 958, 98, doi: 10.3847/1538-4357/acf7c1

[14] *Molecules with ALMA at Planet-forming Scales (MAPS). I. Program Overview and Highlights*, Öberg, K. I., Guzmán, V. V., Walsh, C., et al. 2021, ApJS, 257, 1, doi: 10.3847/1538-4365/ac1432

[13] *Molecules with ALMA at Planet-forming Scales (MAPS). II. CLEAN Strategies for Synthesizing Images of Molecular Line Emission in Protoplanetary Disks*, Czekala, I., Loomis, R. A., Teague, R., et al. 2021, ApJS, 257, 2, doi: 10.3847/1538-4365/ac1430

[12] *Molecules with ALMA at Planet-forming Scales (MAPS). III. Characteristics of Radial Chemical Substructures*, Law, C. J., Loomis, R. A., Teague, R., et al. 2021, ApJS, 257, 3, doi: 10.3847/1538-4365/ac1434

[11] *Molecules with ALMA at Planet-forming Scales (MAPS). IV. Emission Surfaces and Vertical Distribution of Molecules*, Law, C. J., Teague, R., Loomis, R. A., et al. 2021, ApJS, 257, 4, doi: 10.3847/1538-4365/ac1439

[10] *Molecules with ALMA at Planet-forming Scales (MAPS). IX. Distribution and Properties of the Large Organic Molecules HC_3N, CH_3CN, and c-C_3H_2*, Ilee, J. D., Walsh, C., Booth, A. S., et al. 2021, ApJS, 257, 9, doi: 10.3847/1538-4365/ac1441

[9] *Molecules with ALMA at Planet-forming Scales (MAPS). V. CO Gas Distributions*, Zhang, K., Booth, A. S., Law, C. J., et al. 2021, ApJS, 257, 5, doi: 10.3847/1538-4365/ac1580

[8] *Molecules with ALMA at Planet-forming Scales (MAPS). VII. Substellar O/H and C/H and Superstellar C/O in Planet-feeding Gas*, Bosman, A. D., Alarcón, F., Bergin, E. A., et al. 2021, ApJS, 257, 7, doi: 10.3847/1538-4365/ac1435

[7] *Molecules with ALMA at Planet-forming Scales (MAPS). XI. CN and HCN as Tracers of Photochemistry in Disks*, Bergner, J. B., Öberg, K. I., Guzmán, V. V., et al. 2021, ApJS, 257, 11, doi: 10.3847/1538-4365/ac143a

[6] *Molecules with ALMA at Planet-forming Scales (MAPS). XII. Inferring the C/O and S/H Ratios in Protoplanetary Disks with Sulfur Molecules*, Le Gal, R., Öberg, K. I., Teague, R., et al. 2021, ApJS, 257, 12, doi: 10.3847/1538-4365/ac2583

[5] *Molecules with ALMA at Planet-forming Scales (MAPS). XIV. Revealing Disk Substructures in Multiwavelength Continuum Emission*, Sierra, A., Pérez, L. M., Zhang, K., et al. 2021, ApJS, 257, 14, doi: 10.3847/1538-4365/ac1431

[4] *Molecules with ALMA at Planet-forming Scales (MAPS). XIX. Spiral Arms, a Tail, and Diffuse Structures Traced by CO around the GM Aur Disk*, Huang, J., Bergin, E. A., Öberg, K. I., et al. 2021, ApJS, 257, 19, doi: 10.3847/1538-4365/ac143e

[3] *Molecules with ALMA at Planet-forming Scales (MAPS). XV. Tracing Protoplanetary Disk Structure within 20 au*, Bosman, A. D., Bergin, E. A., Loomis, R. A., et al. 2021, ApJS, 257, 15, doi: 10.3847/1538-4365/ac1433

[2] *Molecules with ALMA at Planet-forming Scales (MAPS). XVII. Determining the 2D Thermal Structure of the HD 163296 Disk*, Calahan, J. K., Bergin, E. A., Zhang, K., et al. 2021, ApJS, 257, 17, doi: 10.3847/1538-4365/ac143f

[1] *Molecules with ALMA at Planet-forming Scales (MAPS). XVIII. Kinematic Substructures in the Disks of HD 163296 and MWC 480*, Teague, R., Bae, J., Aikawa, Y., et al. 2021, ApJS, 257, 18, doi: 10.3847/1538-4365/ac1438

Successful Observing Proposals as PI

ALMA Cycle 8: 2022.1.00554.S, 15.7 h, Grade A — Aug. 2022
Determining the primary nitrogen reservoir by ammonia ice deuteration

ALMA Cycle 8: 2022.1.00438.S, 11.4 h, Grade A — Aug. 2022
Resolving the CO_2 snowline in the protostellar envelope of L483

VLA 2022B: 22B-219, 6.0 h, Grade B — May. 2022
Constraining the main nitrogen reservoir with ammonia ice deuteration

ALMA Cycle 7: 2021.1.00535.S, 25.2 h, Grade B — Aug. 2021
High resolution observations of deuterated hydrocarbons in protoplanetary disks

Talks and Presentations

ALMA-J Seminar — Oct. 2023
TBD — *(invited)*

Astrochemistry Get-together Workshop — Jul. 2023
ALMA Observations of Complex Organic Molecules in Protoplanetary Disks — *(invited)*

Protostars and Planets VII — Apr. 2023
Early Planet Formation in Embedded Disks (eDisk): The Ringed and Warped Structure of the Disk around the Class I Protostar L1489 IRS — *(Poster)*

Symposium on Next Generation Astrochemistry — Nov. 2022
Constraining the primary nitrogen reservoir by ammonia ice deuteration

Molecules in Extreme Environments: Near and Far — Nov. 2022
Early Planet Formation in Embedded Disks (eDisk): Dust and molecular substructures in the disk around Class I source L1489 IRS

Astrochemical Frontiers 2021 Quarantine Edition 2 — Jul. 2021
Deuterium chemistry and ionization rate in protoplanetary disks

From Cores to Codes: Planning for the Next Steps in Planet Formation — Mar. 2021
Deuterium fractionation and ionization rate in proto-planetary disks by MAPS project

East Asian ALMA Science Workshop 2021 — Feb. 2021
Deuterium fractionation and ionization in protoplanetary disks probed by N_2H^+ and N_2D^+

Five Years After HL Tau: A New Era on Planet Formation — Dec. 2020
ALMA Observations of N_2H^+ and N_2D^+ in Protoplanetary Disks