Ren Thomas C. Marquez

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Education

Ph.D., Geochemistry (Isotope Cosmochemistry), California Institute of Technology	2018-2024
M.Sc., Geochemistry, California Institute of Technology	2021
M.Sc., Geology (Isotope Geochemistry), University of the Philippines – Diliman	2015-2018
B.Sc., Geology, University of the Philippines – Diliman, Magna cum Laude	2010-2014

Professional Experience

Hess Postdoctoral Fellow, Department of Geosciences (Princeton University)	2026-
Postdoctoral Fellow, Buseck Center for Meteorite Studies (Arizona State University)	2024-2026
Graduate Researcher/Teaching Assistant (California Institute of Technology)	2019-2023
Instructor IV (University of the Philippines)	2015-2018
Co-lead, LA-ICPMS Laboratory (University of the Philippines)	2016-2018
Guest Researcher (JAMSTEC)	2016 (Apr-Jun)
Science Research Specialist II (Phil. Inst. of Volcanology and Seismology)	2015 (Feb-July)

Honors and Awards

Meteoritical Society and GSA Planetary Division Pellas-Ryder Award for Best Student Paper (2024)
Caltech GPS Richard H Jahns Teaching Award (2021)
UP College of Science Most Outstanding M.S. Graduate (2018)
Iuvenis Orbis Geology Merit Award for Graduate Academic Excellence (2017)
Leticia Shahani Best Undergraduate Research Award for Geology (2014)
Iuvenis Orbis Geology Merit Award for Undergraduate Academic Excellence (2012)
University of the Philippines Dean's List (University Scholar, 2010-2014)

Publications

Peer-reviewed

6. Hu, J.Y., Tissot, F.L., Marquez, R.T., Shorttle, O., Clarke, C.J., Sellek, A. D., ... & Williams, H.M. (2025). Rare earth element nucleosynthetic anomalies and dust transport in the protoplanetary disk. Science Advances, 11(28), eadv3148.

5. Marquez, R.T., Charlier, B.L.A., & Tissot, F.L.H. (2024) Snapshots of an evolving solar nebula recorded in nucleosynthetic Sr & Ba signatures of early condensates. Astrophysical Journal Letters, 961 L15.

4. Budde, G., Tissot, F. L., Kleine, T., & Marquez, R.T. (2023). Spurious molybdenum isotope anomalies resulting from non-exponential mass fractionation. Geochemistry, 126007.

3. Marquez, R.T., & Tissot, F. L. (2022). COSMO: Double spike optimization for sample-limited analyses of isotopically anomalous materials. Chemical Geology, 612, 121095.

2. Charlier, B. L., Tissot, F. L., Vollstaedt, H., Dauphas, N., Wilson, C. J., & Marquez, R.T. (2021). Survival of presolar p-nuclide carriers in the nebula revealed by stepwise leaching of Allende refractory inclusions. Science Advances, 7(28), eabf6222.

1. Marquez, R.T.C., Tejada, M. L. G., Suzuki, K., Peleo-Alampay, A. M., Goto, K. T., Hyun, S., & Senda, R. (2017). The seawater osmium isotope record of South China Sea: Implications on its history and evolution. Marine Geology, 394, 98–115.

In review/revision

2. Li, J., Marquez, R.T., Budde G., Tang, H., Ivanova, M., Villeneuve, J., & Tissot, F.L.H. (in review). Rapidly evolving composition of nebular infall recorded by magnesium isotopes in refractory inclusions.

1. Marquez, R.T., Charlier, B.L.A., & Tissot, F.L.H. (in revision). Stardust as nucleation seeds for the earliest solids in the Solar System.

Conference Presentations

18. Charlier, B.L., Marquez, R.T., & Wilson, C.J. (2025). Elemental, Sr and Pb isotopic variability of alteration phases in Nakhla and Yamato 000593: Insights from step leaching experiments. In 2025Goldschmidt Conference – Poster Presentation.

17. Mueller, J., de Kleer, K., Ehlmann, B. L., Tissot, F., Rossman, G. R., Greenberger, R. N., Marquez, R.T.C., & Ivanova, M. (2024). Near-and mid-infrared reflectance mapping of Calcium-Aluminum-rich inclusions and applications for remote sensing of asteroids. In AGU Fall Meeting Abstracts (Vol. 2024, No. 3021, pp. P21E-3021).

16. Li, H., Budde, G., Tang, H., Marquez, R.T.C., Ivanova, M.A., & Tissot, F.L.H. (2024). Mg isotope composition of CAIs from CV chondrites and implication for early Solar System heterogeneity. In 2024 Goldschmidt Conference – Oral Presentation.

15. Marquez, R. T. C., Charlier, B. L., & Tissot, F. L. H. (2024). Carriers of Extreme Strontium Anomalies in Early Solar System Condensates. LPI Contributions, 3040, 2010 – Oral Presentation.

14. Marquez, R. T. C., Charlier, B. L. A., & Tissot, F. L. H. (2023). Snapshots of an Evolving Solar Nebula Recorded in Nucleosynthetic Strontium and Barium Signatures of Early Condensates. In 86th Annual Meeting of the Meteoritical Society (No. 6303) – Oral Presentation.

13. Mueller, J.M., Ehlmann, B.L., Rossman, G.R., Greenberger, R.N., Marquez, R.T., Ivanova, M.A., Tissot, F.L.H. and de Kleer, K. (2023). A Spectral Database of Calcium-Aluminum-Rich Inclusions and Applications to Asteroid Observations. LPI Contributions, 2806, p.1925. – Poster

12. Budde, G., Marquez, R. T., Ivanova, M. A., & Tissot, F. L. H. (2023). Molybdenum Isotope Systematics of Calcium-Aluminum-Rich Inclusions. LPI Contributions, 2806, 2203. – Oral Presentation

11. Marquez, R. T., Charlier, B. L., Abbott, T., Smeets, P., Heck, P. R., & Tissot, F. L. H. (2022). Search for the Carriers of p-process Anomalies in Early Solar System Condensates. In 2022 Goldschmidt Conference. – Poster

10. Tissot, F. L. H., Charlier, B. L. A., Vollstaedt, H., Dauphas, N., Wilson, C. J. N., & Marquez, R. T. (2021). Evidence for the Survival of a P-Process Anomaly Carrier in Fine-Grained CAIs from Allende. In 52nd Lunar and Planetary Science Conference (No. 2548, p. 2641). – Oral Presentation

9. Marquez, R. T. C., Charlier, B. L. A., & Tissot, F. L. H. (2021). Search for the carriers of anomalous nucleosynthetic signatures in early solar system condensates. In 52nd Lunar and Planetary Science Conference (No. 2548, p. 2635) – Poster.

8. Johnson, D., Gutierrez, M., Present, T., Peerthum, Y., Marquez, R. T., & Adkins, J. F. (2019). Sedimentary Sulfur Cycling in Deep Ocean Oxygenated Settings. In AGU Fall Meeting Abstracts (Vol. 2019, pp. B11L-2251 – Poster.

7. Marquez, R. T. C. & Tissot, F. L. H. (2019). Optimal Double Spike for High-Precision Measurements of Stable Isotopes in Early Solar System Materials. In 50th Lunar and Planetary Science Conference (No. 2132, p. 3159) – Poster.

6. Urquico-Zialcita, J. C. D., Apolinario, A. N., Austria J. M. V., Binuya, A. M. E., Delina R. E. G., Doyongan Y. I. L., Jimenez J. J. C., Marquez, R. T. C., Muyco, C. A. O., Somosa M. A. O., Uy, M. A. C., de Silva Jr. L. P., Fernando A. G. S., -Alampay, A. M. Geology of Caramoan Peninsula Revisited. Paladutaan 2017 Institute Symposium – Oral Presentation.

4. Marquez, R. T. C., Tejada, M. L. G., Suzuki, K., Peleo-Alampay, A. M., Goto, K. T., Hyun, S., & Senda, R. Tectonic Evolution and History of the South China Sea: Clues from Re-Os Isotopes. Goldschmidt Conference 2017 – Poster.

3. Goto, K. T., Sakaguchi, A., Tejada, M. L. G., Lachner, J., Ploner, M., Usui, A., Marquez, R. T. C., Hanyu, T. & Suzuki, K. Comparison of Os Isotope and Be-10 Ages of Hydrogenous Ferromanganese Crusts. The Geological Society of America 113th Annual Meeting 2017 – Poster.

2. Marquez, R. T. C., Tejada, M. L. G., Suzuki, K., Peleo-Alampay, A. M., Goto, K. T., Hyun, S., & Senda, R. The seawater osmium isotope record of South China Sea: Implications on its history and evolution. AGU Fall Meeting 2016 – Poster.

1. Marquez, R. T. C., Tejada, M. L. G., Suzuki, K., Peleo-Alampay, A. M., Goto, K. T., Hyun, S., & Senda, R. The seawater osmium isotope record of South China Sea: Implications on its history and evolution. Paladutaan 2016 - Institute Symposium – Oral Presentation.

Grants and Scholarships

Future Investigators in NASA Earth and Space Science and Technology (2021-2024)

SHyNE External Experiment Development (SEED) Grant (2022)

Caltech Center for Comparative Planetary Evolution Grant (2021)

Jose Ma. Feliciano Graduate Scholarship Award (2017-2018)

EAG Goldschmidt Conference Travel Grant (2017)

University of the Philippines Office of International Linkages Collaborative Research Grant (2016)

University of the Philippines Research Dissemination Grant (2016)

National Institute of Geological Sciences Research Grant (2016)

Philippine National Oil Company Exploration Corp. Scholarship (2013-2014)

Romeo Flores Scholarship Award (2012-2014)

Jose Ma. Feliciano Undergraduate Scholarship Award (2010-2012)

Teaching

at UP Diliman: Undergraduate classes (lecture and laboratory) for the following courses: Principles of Geology, Mineralogy, Structural Geology, Petrology, Metalliferous Ore Deposits, Field Geology, and Stratigraphy.

at Caltech: Teaching Assistant for Radiogenic Isotopes (Tissot), Isotope Cosmochemistry (Tissot), and Paleoceanography (Adkins).

Professional Service

Reviewer for international scientific journals such as Geochimica et cosmochimica acta, Nature Communications, and Palaeogeography, palaeoclimatology, palaeoecology.

Skills and Training

Laboratory and Mass Spectrometry

Clean Laboratory - Nine (9) years of experience working in a Class 100 clean laboratory. Capable of analytical techniques relevant to isotope geochemistry/cosmochemistry such as acid digestion, ion exchange chromatography, as well tasks for daily maintenance of a wet chemistry lab such as acid distillation, titration, and laminar flow bench repair. Extensive knowledge on double-spike technique and optimization for cosmochemical applications.

Instrumentation - Capable of operating a Thermo Fisher Triton TIMS for high-precision work on low-concentration samples using $10^{13}\Omega$ detectors, a Thermo Fisher Neptune/Neoma MC-ICPMS, iCap Quadrupole ICPMS, and EA-IRMS proficiently. Experienced with in situ techniques for the NanoSIMS (50L) and associated sample preparation techniques.

Tools for characterization - Capable of operating several geochemical tools such as X-ray Diffraction, X-ray Fluorescence, and SEM-EDS.

Computer and Software

Proficient in programming languages such as Python, and MATLAB. Limited experience in C++, Bash, R, Julia, Mathematica, as well as database management systems like MySQL.

Basic knowledge and operation of various GIS software such as ArcGIS, QGIS, Global Mapper, MapInfo, Maptek I-site and ENVI.