

Dr. Ny Riavo G. Voarintsoa (short CV)

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INTERESTS: Geology, Geochemistry (conventional isotopes, trace elements, triple oxygen isotopes, clumped isotopes in carbonates), Mineralogy, Petrography, Paleoclimate and Paleoenvironmental reconstruction, Quaternary Research, Intertropical Convergence Zone, Monsoon, Africa, Madagascar, Caves, Lakes

PROFESSIONAL APPOINTMENTS

Research Assistant Professor, Department of Earth and Atmospheric Sciences, University of Houston, USA. 2021–present

Marie Skłodowska Curie Postdoctoral Fellow, Department of Earth and Environmental Sciences, Katholieke Universiteit Leuven, Belgium. “*PALEOMADA: Paleoenvironmental Reconstruction in Madagascar*”. 2019–2021.

Postdoctoral Researcher, The Fredy & Nadine Herrmann Institute of Earth Sciences, The Hebrew University in Jerusalem, Israel. “Clumped isotopes and triple oxygen geochemistry of carbonates”. Oct 2017–Feb 2019.

Research Assistant, Department of Geography, University of Georgia, USA. “Investigating magnetic susceptibility in various sediments from Southern Africa (soil, sand ramps, lake sediments)”. May–June 2017.

EDUCATION

PhD in Geology, Department of Geology, University of Georgia (May 2017)

MSc. Geology, Department of Geology, University of Antananarivo, Madagascar (2012)

Visiting Scholar, Williams College, Williamstown MA 01267 (2010-2011)

BSc. Geology, Department of Geology, University of Antananarivo, Madagascar (2008)

TEACHING EXPERIENCE

2013-2015

GEOL 1121 and 1121 L: Earth Processes and Environment
University of Georgia

1. Instructor of Records (Summer 13, 14, 15, 16)
2. Lab TA coordinator (Fall 13, 14)
3. Tutor at the Rankins UGA Athletic Association (Fall13, Spring 14)

2013-2015

GEOL 4060/6060, Structural Geology
University of Georgia

1. Teaching Assistant (Spring 13, 14, 15)
2. Lab Instructor (Spring 13, 14, 15)

2009-2010

Introductory Geology, Crystallography, and Mineralogy/Geochemistry
Institut Supérieur en Géologie de l'Ingénieur et de l'Environnement, Madagascar
1. Instructor

PUBLICATIONS

Submitted/In revision/In prep.

18. **Voarintsoa, N.R.G.**, (in press) The Malagasy monsoon over the Holocene: a review from speleothem $\delta^{18}\text{O}$ records. *Malagasy Nature* (invited)

Published (peer-reviewed)

17. Li, H., Sinha, A., André, A.A., Spötl, C., Vonhof, H.B., Meunier, A., Kathayat, K, Duan, P **Voarintsoa, N.R.G.**, Ning, Y., Biswas, J., Hu, P., Li, X., Sha, L., Zhao, J., Edwards, R.L., Cheng, H., (Accepted, in press). A multi-millennial climatic context for the megafaunal extinctions in Madagascar and Mascarene Islands. *Science Advances*
16. Fohlmeister, J., Voarintsoa, N.R.G, Lechleitner, F., Boyd, M., Brandstätter, S., Jacobson, M.J., and Oster, J. 2020. Main Controls on the Stable Carbon Isotope Composition of Speleothems. *Geochimica et Cosmochimica Acta* 279,67–87.
15. **Voarintsoa, N.R.G.**, Barkan, E., Bergel, S., Vieten, R. and Affek, H.P., 2020. Triple oxygen isotope fractionation between CaCO_3 and H_2O in inorganically precipitated calcite and aragonite. *Chemical Geology* 539, p.119500.
14. **Voarintsoa, N.R.G.**, Raveloson, A., Barimalala, R., Razafindratsima, O.H., 2019. 'Malagasy' or 'Madagascan'? Which English term best reflects the people, the culture, and other things from Madagascar? *Scientific African* 4, e00091.
13. Wang, L., Brook, G.A., Burney, D.A., **Voarintsoa, N.R.G.**, Liang, F., Cheng, H., Edwards, R.L., 2019. The African Humid Period, rapid climate change events, the timing of human colonization, and megafaunal extinctions in Madagascar during the Holocene: Evidence from a 2m Anjohibe Cave stalagmite. *Quaternary Sci Rev* 210, 136–153.
12. Barkan E., Affek, H.P., Luz, B., Bergel, S., **Voarintsoa, N.R.G.**, and Musan, I. 2019. Calibration of $\delta^{17}\text{O}$ and $^{17}\text{O}_{\text{excess}}$ of three international standards - IAEA603, NBS19 and NBS18. *Rapid Comm. Mass. Spec.* 33, 737-740.
11. **Voarintsoa, N.R.G.**, Matero, I.S.O., Railsback, L.B., Gregoire, L.J., Tindall, J., Sime, L., Cheng, H., Edwards, R.L., Brook, G.A., Kathayat, G., Li, X., Michel Rakotondrazafy, A.F., Madison Razanatsheho, M.O., 2019. Investigating the 8.2 ka event in northwestern Madagascar: Insight from data–model comparisons. *Quaternary Sci Rev* 204, 172-186.
10. Railsback, L.B., Brook, G.A., Liang, F., **Voarintsoa, N.R.G.**, Cheng, H., and Edwards, R.L., 2018, A multi-proxy climate record from a northwestern Botswana stalagmite suggesting wetness late in the Little Ice Age (1810-1820 CE) and drying thereafter in response to changing migration of the tropical rain belt or ITCZ: *Palaeogeography, Palaeoclimatology, Palaeoecology*, v. 506, p. 139-153.
9. Railsback, L.B., Liang, F., Brook, G.A., **Voarintsoa, N.R.G.**, Sletten, H.R., Marais, E., Hardt, B., Cheng, H., Edwards, R.L., 2018. The timing, two-pulsed nature, and variable climatic expression of the 4.2 ka event: A review and new high-resolution stalagmite data from

- Namibia. *Quaternary Sci Rev* 186, 78-90.
8. **Voarintsoa, N.R.G.**, Railsback, L.B., Brook, G.A., Wang, L., Kathayat, G., Cheng, H., Li, X., Edwards, R.L., Rakotondrazafy, A.F.M., Madison Razanatseheno, M.O., 2017. Three distinct Holocene intervals of stalagmite deposition and nondeposition revealed in NW Madagascar, and their paleoclimate implications. *Clim. Past* 13, 1771-1790. *Special Issue: Southern Hemisphere Assessment of PalaeoEnvironment (SHAPE)*
 7. **Voarintsoa, N.R.G.**, Wang, L., Railsback, L.B., Brook, G.A., Liang, F., Cheng, H., Edwards, R.L., 2017, Multiple proxy analyses of a U/Th-dated stalagmite to reconstruct paleoenvironmental changes in northwestern Madagascar between 370 CE and 1300 CE, *Palaeogeography, Palaeoclimatology, Palaeoecology*. v. 469, p. 138–155. <http://dx.doi.org/10.1016/j.palaeo.2017.01.003>.
 6. **Voarintsoa, N.R.G.**, Brook, G. A., Liang, F., Marais, E., Hardt, B., Cheng, H., Edwards, R. L., and Railsback, L. B., 2017, Stalagmite multi-proxy evidence of wet and dry intervals in northeastern Namibia: Linkage to latitudinal shifts of the Inter-Tropical Convergence Zone and changing solar activity from AD 1400 to 1950: *The Holocene*, v. 27, no. 3, p. 384–396. doi:10.1177/0959683616660170.
 5. Brook, G.A., Railsback, L. B., Scott, L., **Voarintsoa, N.R.G.**, Liang, F., 2015, Late Holocene Stalagmite and Tufa Climate Records for Wonderwerk Cave: Relationships Between Archaeology and Climate in Southern Africa: *African Archaeological Review*, v. 32, no. 4, p. 1–32.
 4. Railsback, L. B., Gibbard, P.L., Head, M.J., **Voarintsoa, N.R.G.**, Toucanne, S., 2015, An optimized scheme of lettered marine isotope substages for the last 1.0 million years, and the climatostratigraphic nature of isotope stages and substages: *Quaternary Science Reviews*, v. 111, p. 94–106.
 3. Railsback, L.B., Akers, P. D., Wang, L. X., Holdridge, G. A., and **Voarintsoa, N.R.**, 2013, Layer-bounding surfaces in stalagmites as keys to better paleoclimatological histories and chronologies: *International Journal of Speleology*, v. 42, no. 3, p. 167–180.
 2. Feneyrol, J., Giuliani, G., Ohnenstetter, D., Fallick, A. E., Martelat, J. E., Monie, P., Dubessy, J., Rollion-Bard, C., Le Goff, E., Malisa, E., Rakotondrazafy, A. F. M., Pardieu, V., Kahn, T., Ichangi, D., Venance, E., **Voarintsoa, N.R.**, Razanatseheno, M. M., Simonet, C., Omito, E., Nyamai, C., and Saul, M., 2013, New aspects and perspectives on tsavorite deposits: *Ore Geology Reviews*, v. 53, p. 1–25.
 1. **Voarintsoa, N.R.G.**, Cox, R., Razanatseheno, M. O. M., and Rakotondrazafy, A. F. M., 2012, Relation between Bedrock Geology, Topography and Lavaka Distribution in Madagascar: *South African Journal of Geology*, v. 115, no. 2, p. 225-250. DOI: 10.2113/gssajg.115.225

Data Contribution

3. **Voarintsoa, N. R. G.**, Railsback, L. B., Brook, G. A., Wang, L., Kathayat, G., Cheng, H., Li, X., Edwards, R. L., Rakotondrazafy, A. F. M., and Madison Razanatseheno, M. O., 2017. Madagascar Holocene Stalagmite Stable Isotope Data. <https://www.ncdc.noaa.gov/paleo/study/22970>.
2. **Voarintsoa, N.R.G.**, Wang, L., Railsback, L.B., Brook, G.A., Liang, F., Cheng, H., and Edwards, R.L., 2017. Anjohibe Cave, Madagascar 370 - 1300 CE Stalagmite MA3 Stable Isotope Data. <https://www.ncdc.noaa.gov/paleo-search/study/22910>.

1. **Voarintsoa, N.R.G.**, Brook, G. A., Liang, F., Marais, E., Hardt, B., Cheng, H., Edwards, R. L., and Railsback, L. B., 2016, Dante Cave, Namibia 550 Year Stalagmite Stable Isotope Data. NOAA National Climatic Data Center, <https://www.ncdc.noaa.gov/paleo/study/20433>

Others

5. **Voarintsoa, N.R.G.**, Raveloson, A., Barimalala, R., Razafindratsima, O., H, 2018. A unified English term that best reflect the people, the culture, and other things from Madagascar: 'Malagasy' instead of 'Madagascan'. hal-01956595
4. **Voarintsoa, N.R.G.**, 2018, Stalagmite reveals climate change clues in northeast Namibia, Africa. featured in "Research Features"
3. **Voarintsoa, N.R.G.**, 2018. Understanding the Holocene paleoenvironmental changes in Madagascar using stalagmites. International Association of Sedimentologists Newsletters no. 271-272, p. 87-88. (ISSN 2294-4931)
2. **Voarintsoa, N.R.G.**, 2017. Investigating stalagmites from NE Namibia and NW Madagascar as a key to better understand local paleoenvironmental changes and implications for inter-tropical convergence zone (ITCZ) dynamics. PhD Thesis. University of Georgia. [<https://athenaeum.libs.uga.edu/handle/10724/37051>]
1. **Voarintsoa, N.R.G.**, 2011. Le grenat vert de la région de Gogogogo (Sud de Madagascar). Diplôme D'Etudes Approfondies (Master's Thesis). University of Antananarivo. A Thesis under the funded project "Caractérisation géologique et gemmologique des 'tsavorites' de Madagascar" between the Département des Sciences de la Terre of the Faculté des Sciences and UMR234 of Institut de Recherches pour le Développement.

ACADEMIC HONORS, AWARDS, and SCHOLARSHIPS

Marie Skłodowska Curie Individual Fellowship Award (2019–2021)

Outstanding Young Alumni Award, Department of Geology, University of Georgia (April 2018)

Office of the Vice President for Research Award, Graduate School, University of Georgia (May 2017).

Outstanding PhD student of the Year 2016–2017, Department of Geology, University of Georgia (April 2017).

Faculty for the Future Fellowship Award, Schlumberger Foundation (2016-2017)

Nominated for the 2017 K. Patricia Cross Future Leaders Award (2016)

John Montagne Fund Award, *for the best proposal in the field of Quaternary Geology and Geomorphology* (2016)

Hendy Scholarship, Summer School on Speleothem Science–S4 (2015)

ANSTO (Australian Nuclear Science and Technology Organization) Scholarship, Summer School on Speleothem Science–S4 (2015)

Faculty for the Future Fellowship Award, Schlumberger Foundation (2015-2016)

Faculty for the Future, Center for Teaching and Learning, UGA (2014-2015)

Miriam Watts-Wheeler Scholarship (2013-2015)

Outstanding Graduate Teaching Assistant Award (2014)

RESEARCH FUNDING (role PI)

- Marie- Skłodowska Curie Fellowship**, *Paleoenvironmental Reconstruction in Madagascar*, €160,800 (2019–2021)
- Faculty for the Future Fellowship Award**, Schlumberger Foundation, \$100,000 (2015-2017)
- International Association of Sedimentologists, Post-Graduate Research Grant**
“*Understanding the Holocene paleoenvironmental changes in Madagascar using stalagmites*”, €975 (2016)
- John Montagne Fund Award**, Geological Society of America Graduate Student Research
“*Developing multi-proxy data set from stalagmites to understand paleoclimate in Madagascar*”, \$2484 (2016)
- Miriam Watts-Wheeler Scholarship Fund** “*Investigating stalagmites from Northwestern Madagascar as a key to better understand climate variability in Southwestern Indian Ocean, and its global implications*”, \$1000 (2015)

TRAVEL GRANTS

- FWO-Travel Grant for a Short Stay abroad**, Field expedition to Madagascar. € 2558.74 (2019)
- Office of the Vice President for Research Award**, Climate Change: Karst Record 8. \$1528.49 (2017)
- The International Union for Quaternary Science**, INQUA, \$1,500, Southern Hemisphere Assessment of PalaeoEnvironments (SHAPE) International Focus Group Workshop: Southern Hemisphere climate of the present and past (2016)
- Support from NSF-AGS 1536461**, \$1,200, ITCZ & Monsoons workshop (2015)
- The International Union for Quaternary Science**, INQUA, ca. £1,500, Summer School on Speleothem Science –S4 (2015)
- Additional support from Xi’an Jiaotong University**, ¥20,000 (2015)
- Miriam Watts-Wheeler Scholarship Award**, \$1,328 (2013-2015)
- Travel support to Madagascar**, \$14,000 (2014)
- Office of the Vice President for Research**, \$633 (2014)
- Geological Society of America Student Travel Funding Award**, \$200 (2013-2014)
- Graduate School Student Travel Funding**, \$450 (2013)
- American Geophysical Union Student Travel Funding Award**, \$500 (2013)

GRANTS AWARDED TO STUDENTS

- Ikala STEM Research Grant**, *Understanding cave responses to its surrounding environmental changes: a test for prior calcite precipitation via cave monitoring*, \$ 650 (Antsa Lal’Aina Johanna Ratovonahary, 2019)

CONFERENCE PRESENTATIONS

20. Dupont, L.A., Railsback, L.B., Brook, G.A., Burney, D.A., Liang, F., **Voarintsoa, N.R.G.**, Cheng, H., and Edwards, R.L., 2020, A Multi-Proxy Stalagmite Record of Paleoenvironmental Change in Equatorial Africa during the African Humid Period, American Geophysical Union, Fall Meeting.
19. **Voarintsoa, N.R.G.**, Ratovonahary, A.L.A., Rakotovao, Z.M., Bouillon, S., 2020. Understanding modern kinetic isotope effect in Anjohibe cave, in Northwestern Madagascar: a key to calibrate speleothem $\delta^{18}\text{O}$ and $\delta^{13}\text{C}$, EGU General Assembly 2020.
18. **Voarintsoa, N. R. G.**, 2019, Geological archives recording environmental and climate changes in the past in NW Madagascar. Colloque Géosciences: ressources, Risques et Technologies. Antananarivo Madagascar. (oral)
17. **Voarintsoa, N. R. G.**, Barkan, E., Bergel, S., Vieten, R., and Affek, H. P., 2019. Experimental calibration of the triple oxygen isotope fractionation between CaCO_3 and H_2O . Goldschmidt. (oral)
16. Affek, H. P., Barkan, E., Bergel, S. J., Vieten, R., **Voarintsoa, N. R. G.**, and Zaarur, S., 2019. Carbonate $^{17}\text{O}_{\text{excess}}$ as a paleohydrology proxy. Goldschmidt. (oral)
15. Brandstätter, S., Fohlmeister, J., **Voarintsoa, N. R. G.**, Lechleitner, F., Boyd, M., Jacobson, M. J., and Oster J., 2019. From local processes to global controls: Disentangling the complexity of carbon isotopes in speleothems using the SISAL database. Geophysical Research Abstracts, Vol. 21, EGU2019-10355, EGU General Assembly 2019. (*Pico presentation*)
14. **Voarintsoa, N. R. G.**, Matero, I. S. O., Gregoire, L.J., L. Railsback, L. B., Tindall, J.C., Sime, L. C., Cheng, H., Edwards, R. L., Brook, G. A., Kathayat, G., Li, X., Rakotondrazafy, A. F. M., and Madison Razanatseheno, M. O., 2018. Stalagmite records and model simulation indicating wet conditions in northwestern Madagascar during the 8.2 ka event. AGU-Ocean Sciences Meeting. (poster)
13. **Voarintsoa, N. R. G.**, Railsback, L. B., Brook, G. A., Wang, L., Kathayat, G., Cheng, H., Li, X., Edwards, R. L., Rakotondrazafy, A. F. M., and Madison Razanatseheno, M. O., 2017. Mutiproxy evidence of a wet 8.2 ka event revealed in NW Madagascar: Linkage to latitudinal shifts of the Inter-Tropical Convergence Zone and the Atlantic Meridional Overturning Circulation. Climate Change: The Karst Record 8. University of Texas in Austin, USA (*oral*)
12. **Voarintsoa, N.R. G.**, Wang, L., Railsback, L.B., Brook, G.A., Liang, F., Cheng, H., Edwards, R.L., 2017, Stalagmites and their uses in paleoenvironmental reconstruction, Interdisciplinary Research and Ideas Symposium (IRIS), Session Period 3: Pre-Fabricated Environment, University of Georgia. (oral)
11. **Voarintsoa, N. R. G.**, Railsback, L. B., Brook, G. A., Wang, L., Kathayat, G., Cheng, H., Li, X., Edwards, R. L., Rakotondrazafy, A. F. M., and Madison Razanatseheno, M. O., 2016, Distinct early-, mid-, and late-Holocene climate in NW Madagascar: evidence from two stalagmites, Southern Hemisphere Assessment of PalaeoEnvironments (SHAPE) International Focus Group Workshop: Southern Hemisphere climate of the present and past, Universidad de Chile, Santiago. (oral)
10. **Voarintsoa, N.R.G.**, 2016, Stalagmite $\delta^{13}\text{C}$ changes and vegetation cover change in northwestern Madagascar. Geological Society of America Abstracts with Programs. Vol. 48, No. 7. doi: 10.1130/abs/2016AM-287917. (oral)

9. **Voarintsoa, N.R.G.**, Railsback, L.B., Brook, G.A., Wang, L., Liang, F., Cheng, H., Edwards, R.L., 2015, Late Holocene (ca. AD 370-1210) ecosystem changes inferred from a stalagmite from northwestern Madagascar: the role of the ITCZ and human activity, American Geophysical Union, Fall Meeting Dec 2015. (poster)
8. **Voarintsoa, N.R.G.**, Brook, G.A., Liang, F., Marais, E., Cheng, H., Edwards, R.L., and Railsback, L.B., 2015, Stronger Monsoon during southward migration of the ITCZ recorded in a Namibian stalagmite. Monsoons & ITCZ: the annual cycle in the Holocene and the Future, Columbia University, Sept 2015. (poster)
7. **Voarintsoa, N.R.G.**, Railsback, L.B., Li, X., Kathayat, G., Cheng, H., Brook, G.A., and Edwards, R.L., 2015, Stalagmite records revealing extensive drier period in northwestern Madagascar between the early and late Holocene (8–1.5 ka B.P.), Summer School on Speleothem Science, Department of Earth Sciences, University of Oxford, Aug 2015. (poster)
6. **Voarintsoa, N.R.G.**, Railsback, L.B., Liang, F., Brook, G.A., Cheng, H., Edwards, R.L., 2014, Control of solar radiation over climate variability in Southern Africa: isotopic and petrographic evidence from Namibia and Botswana stalagmites. Geological Society of America, Abstracts with Programs, vol. 46, No. 6, p. 126. (poster)
5. **Voarintsoa, N.R.G.**, Railsback, L.B., Liang, F., Brook, G.A., Cheng, H., Edwards, R.L., 2013, Evidence of past climate change in the Little Ice Age and of the Pacific Decadal Oscillation periodicity in Africa: comparison between two neighbor stalagmites from Namibia and Botswana (preliminary results). American Geophysical union, Fall Meeting 2013, abstract # PP31B-1864. (poster)
4. **Voarintsoa, N.R.G.**, Madison Razanatseheno, M.O., Rakotondrazafy, A.F.M., Giuliani, G., 2013, Mineralogy, Geochemistry, and Petrology of a new green grossular garnet ("tsavorite") found in Madagascar, and its tectonic implication. Geological Society of America, Abstracts with Programs, vol. 45, No. 7, p. 538. (poster)
3. **Voarintsoa, N.R.G.**, Cox, R., Madison Razanatseheno, M.O., Rakotondrazafy, A.F.M., 2012, Investigating the role of bedrock geology and slope in controlling Lavaka (gully) distribution in Central Madagascar. Geological Society of America, Abstracts with Programs, vol. 44, No. 7, p. 417. (poster)
2. Feneyrol J., Giuliani G., Ohnenstetter D., Malisa E.P., Rakotondrazafy A.F.M, Ichang'ïD., Venance E., **Voarintsoa N.R.G.**, Razanatseheno, M.O.M., Omito E., Nyamai C, 2011, La Tsarovite dans la ceinture métamorphique néopro-térozoïque Mozambicaine: un exemple the marqueur géologique entre l'Afrique de l'Est et Madagascar. Journées SGF à Paris dédiées à Madagascar.
1. Rakotondrazafy A.F.M., Giuliani G., Razanatseheno M.O.M, Ohnenstetter D., Ralantoarison L.T., Andriamamonjy S.A, Rakotosamizanany S., **Voarintsoa N.R.G.**, 2011, Les types de gisements de corindons du socle cristallin de Madagascar, Journées SGF à Paris dédiées à Madagascar.