Roberto H. Tellez Vizcaino

PhD Candidate (Applied Geosciences), IPICYT — Igneous Petrology & Volcanic Geochemistry

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Expected PhD defense: summer 2026.

RESEARCH INTERESTS

- Ocean-island volcanism and monogenetic volcanic systems
- Pyroclastic stratigraphy, hydrovolcanism, and eruptive style transitions
- Igneous petrology and geochemistry (major/trace/REE) + mineral chemistry (EPMA)
- Radiogenic isotopes (Sr–Nd–Pb) and mantle source constraints
- Quantitative data integration (Python, PCA, clustering) and reproducible workflows

EDUCATION

- PhD in Applied Geosciences (in progress), IPICYT, Mexico, 2022–present.
- MSc in Applied Geosciences, IPICYT, Mexico, Aug 2016–Jul 2018 (degree exam May 25, 2020).
- BSc in Environmental Sciences and Risk Management, University of Colima, Mexico, Aug 2012–Jul 2016 (Peña Colorada Award, 2016).

DOCTORAL PROJECT (SUMMARY)

Working title: Eruptive evolution and magmatic processes of Bárcena (1952–53), Isla San Benedicto (Revillagigedo Archipelago, Mexico). The project integrates field stratigraphy and facies analysis with whole-rock chemistry (XRF, ICP-MS), mineral chemistry (EPMA), SEM textures, and radiogenic isotopes (TIMS) to test hypotheses of reservoir stratification, differentiation, and the hydrovolcanic-to-effusive transition.

RESEARCH EXPERIENCE

PhD research — Isla San Benedicto / Bárcena (Revillagigedo), Mexico | 2022–present

- Fieldwork: 15-day campaign; updated geologic mapping and stratigraphic logging with systematic sampling of pyroclastics and lava.
- Whole-rock chemistry: XRF majors (n=26 analyses) and ICP-MS trace/REE (n=12); data integration and QA/QC; multivariate analysis (PCA, hierarchical clustering).
- Petrology & textures: petrography (20 thin sections across 16 samples); XRD (n=10); granulometry + componentry; SEM imaging (10 juvenile pumice samples; multi-scale strategy).
- Mineral chemistry (EPMA): 12 samples; plagioclase (n=30 crystals; 90 core–mid–rim spots), pyroxene (n=20 spots), oxides (n=10 spots); mounting/polishing and analysis session execution (instrument calibration by staff).
- Radiogenic isotopes (TIMS): 6 samples; Sr–Nd–Sm on whole rock and Pb from leached feldspar concentrates; hands-on clean-lab preparation and measurement sessions; data QC and interpretation.

MSc research — Los Humeros Caldera, Mexico | 2016–2020

- Three field campaigns (≈15 days total); stratigraphy and volcanology of the Xoxoctic Tuff; eruption reconstruction and magma mixing.
- MSc project supported by CEMIEGeo (Mexican Center for Innovation in Geothermal Energy).

PUBLICATIONS

- Téllez Vizcaíno, R. H., Dávila Harris, P., & Carrasco Núñez, G. (2026). Estratigrafía e historia eruptiva de la erupción pliniana que originó la Pómez Xoxoctic, Caldera Los Humeros, México. Geofísica Internacional, 65(1), 1863–1892. https://doi.org/10.22201/igeof.2954436xe.2026.65.1.1851 [in Spanish]

CONFERENCE PRESENTATIONS

- Téllez-Vizcaíno, R. H., Dávila-Harris, P., Koornneef, J. M., Lippert, P. C., Rojas-Agramonte, Y., & van Hinsbergen, D. J. J. (2025). Evolución eruptiva y geoquímica del Volcán Bárcena (1952–1953), Isla San Benedicto: un modelo transicional en volcanismo insular [Eruptive and geochemical evolution of Bárcena Volcano (1952–1953), Isla San Benedicto: a transitional model in island volcanism] [oral presentation, session VUL-17]. Reunión Anual UGM 2025, Puerto Vallarta, Jalisco, Mexico.
- Téllez-Vizcaíno, R. H., Dávila-Harris, P., van Hinsbergen, D. J. J., Rojas-Agramonte, Y., Winter, C., & López-Ávila, E. (2025). Actualización del mapa litológico de Isla San Benedicto: cartografía, estratigrafía y geoquímica de un volcán isla activo en el Pacífico Mexicano [Updated lithologic map of Isla San Benedicto: mapping, stratigraphy, and geochemistry of an active island volcano in the Mexican Pacific] [poster, session VUL-35]. Reunión Anual UGM 2025, Puerto Vallarta, Jalisco, Mexico.
- Téllez-Vizcaíno, R. H., Dávila-Harris, P., Rojas-Agramonte, Y., Koornneef, J. M., Lippert, P. C., Philippon, M., & van Hinsbergen, D. J. J. (2024). Revisión de Isla San Benedicto a 71 años de la formación del Cono Bárcena (1952–1953), Archipiélago de Revillagigedo, México [Review of Isla San Benedicto 71 years after the formation of Bárcena Cone (1952–1953), Revillagigedo Archipelago, Mexico] [poster #443]. Cities on Volcanoes 12, Antigua Guatemala.
- Téllez Vizcaíno, R. H., Dávila-Harris, P., Rebecchi, M., Ellis, B. S., & Carrasco Núñez, G. (2018). La Toba Xoxoctic, Pleistoceno Superior de la Caldera de Los Humeros, Puebla: erupción sub-pliniana con mezcla magmática [Xoxoctic Tuff, Upper Pleistocene, Los Humeros Caldera (Puebla): sub-Plinian eruption with magma mixing] [oral presentation]. Reunión Anual UGM 2018, Puerto Vallarta, Jalisco, Mexico (Oct 28–Nov 2).

ANALYTICAL TRAINING (HANDS-ON)

- Electron microprobe (JEOL JXA-8230): mineral separation, mounting/polishing, analytical session execution, and post-processing.
- SEM: imaging workflows for juvenile clast microtextures; multi-scale imaging strategy.
- Radiogenic isotopes (Nu Instruments TIMS, CICESE LEMITE): clean-lab preparation, ion-exchange chromatography, measurement sessions, and data QC.
- XRD (Rigaku SmartLab), petrography microscopy, and whole-rock sample preparation workflows.
- General sample preparation (dirty lab): sample receiving/logging, crushing, sieving/granulometry, mineral separation (magnetic, heavy liquids, hand-picking), XRF briquettes, and thin-section preparation.

PROFESSIONAL DEVELOPMENT (SELECTED COURSES)

- Dinámica de los sistemas volcánicos desde la petrología — Instituto de Geofísica, UNAM [Volcanic system dynamics from petrology — Institute of Geophysics, UNAM] (13 h), Jan 2024.

- Curso de Volcanología (2nd edition): Campos Volcánicos de San Luis Potosí — UASLP [Volcanology course: San Luis Potosí volcanic fields — UASLP] (36 h), Aug 2023.
- Vulcanología — Instituto de Geofísica, UNAM [Volcanology — Institute of Geophysics, UNAM] (60 h; 7 credits; grade 10), Aug–Nov 2023.
- Introducción a las técnicas de análisis químico para Ciencias de la Tierra (nivel básico) — IGL-UNAM [Intro to geochemical analytical techniques for Earth Sciences (basic level) — IGL-UNAM] (10 h), May 2023.

TEACHING & MENTORING

- Research-module advisor (vulcanology): 'Alcances y modelado de la dispersión de tefra…' University of Guadalajara (CUSur), Dec 2024.
- Instructor — Volcanology I course-workshop (Permanent Seminar on Earth Sciences), University of Guadalajara (CUSur), Mar 27–31, 2023.

OUTREACH & SERVICE (SELECTED)

- Memberships: International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI); Asociación Latinoamericana de Volcanología (ALVO); Geological Society of America (GSA); Society of Economic Geologists (SEG).
- Participant — XXVI Semana de la Ciencia, Cultura & Salud, San Luis Potosí, Jun 2024.
- Participation — Feria de las Ciencias (Special Education Zone No. 17), Jaraí Palisano, SLP, Oct 2023.
- Infovolcán — volcanology outreach; invited talks (ALVO 2020; INGEMMET–OVI 2021).

PROFESSIONAL EXPERIENCE

- Environmental consultant — COGA (Construction and Environmental Management), 2019–2021: environmental impact assessments, risk/management reports, and regulatory follow-up coordination.

SAFETY & COMPLIANCE TRAINING

- Training — Types/modalities of gender-based violence and institutional reporting pathways (IPICYT), Jun 14, 2024.
- DC-3 (STPS) — First aid (8 h), Jun 29, 2023.
- DC-3 (STPS) — Fire prevention & firefighting: extinguisher handling and use (3 h), Jun 28, 2023.

SERVICE & LEADERSHIP

- Student representative (PhD program) — IPICYT Internal Student Council (Consejo Estudiantil), 2023–2024: co-organized the XII Congreso Interdisciplinario de Posgrados (CONIP) 'Agua, Ciencia y Sociedad'; coordinated workshops and logistics; supported the Applied Geosciences parallel conference session and on-site first-aid brigade.
- Member — First Aid and Firefighting Brigade (IPICYT), 2023–2024: emergency response drills - safety protocols and annual institutional training.

LANGUAGES

- Spanish (native).
- English (advanced) — TOEFL iBT 99 (2023).

REFERENCES

- Pablo Dávila-Harris — IPICYT (PhD advisor).
- Gerardo Carrasco Núñez — UNAM.
- Yamirka Rojas — Universität Heidelberg
- Nick Varley — UCOL
- Douwe Van Hiensenberg — Utrecht University