

# Report for the Joint Use/Research of the Institute for Planetary Materials, Okayama University for FY2024

May 30 2025

**Category:** ☒ International Joint Research ☐ General Joint Research ☐ Joint Use of Facility  
☐ Workshop

## Name of the research project:

Exploring the Colombian Geothermal Diversity along the Southwest Volcanic Arc, as a Tool  
for Peacebuilding, Resilience and Climate Actions

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## Principal applicant:

**Name:** Dr. María Isabel Marín-Cerón

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## Collaborator:

**Name:** Dr. Ryoji Tanaka

**Affiliation:** Institute for Planetary Materials, Okayama University

**Email:** ryoji@okayama-u.ac.jp

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## Method of Implementation:

☒ Onsite (visit to IPM)

☐ Remote

☐ Undetermined

**Visit dates:** June 20–24, 2024 (5 days, 1 person)

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## **Research Report:**

### **1. Research purpose:**

This initial visit to the Institute for Planetary Materials aimed to present the framework and research concept for a long-term collaborative project on geothermal diversity in southwestern Colombia. The study focuses on identifying geothermal resources associated with volcanic activity and assessing their relevance to sustainable development, peacebuilding, and climate action in post-conflict regions.

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### **2. Conducted research:**

During the onsite visit in June 2024, the following activities were carried out:

- Presentation of the Colombian geothermal context and preliminary data from the Doña Juana–Petacas volcanic complex to IPM researchers.
  - Technical discussions with Dr. Ryoji Tanaka and other IPM faculty on methodologies for geochemical and isotopic analysis of thermal waters, gases, and volcanic rocks.
  - Planning of a comprehensive research framework for FY2025, including sample preparation protocols, instrumentation (XRF, ICP-MS, EPMA, TIMS), and potential timelines.
  - A laboratory tour and demonstration of analytical workflows for geothermal fluid characterization.
  - Collaborative drafting of a research outline and budget estimation for a full proposal to be submitted in FY2025, supported by the Colombian government.
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### **3. Research outcomes:**

- Strengthened academic cooperation between Universidad EAFIT and IPM-Okayama in the field of planetary materials and geothermal studies.
- Defined scope for a future joint research proposal involving geochemical and isotopic investigation of Colombian geothermal systems.
- Identified potential for innovation in the integration of geodiversity into socio-environmental and peacebuilding strategies in Colombia.
- Obtained institutional support for applying to funding calls related to the UNESCO Chair in Geodiversity, Peace and Climate Action.

- Initiated a joint publication plan and dissemination strategy targeting international conferences and indexed journals in 2025–2026.
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#### **4. Equipment discussed for future analysis (FY2025 proposal):**

- **XRF (X-ray fluorescence)**
  - **ICP-MS (Inductively Coupled Plasma Mass Spectrometry)**
  - **TIMS (Thermal Ionization Mass Spectrometry)**
  - **EPMA (Electron Probe Micro-Analyzer)**
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#### **5. Related publications and research profile:**

Dr. María Isabel Marín-Cerón's academic publications and ongoing research activities can be accessed via:

 <https://www.researchgate.net/profile/Maria-Marin-Ceron/publications>

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