

Song Xue, Harvard University, Cambridge, Massachusetts, USA for his project: *Constraining the Initiation of Plate Tectonics Using Process-Sensitive Zircon Zr Isotope Systematics*.

Song Xue is a Ph.D. student in the Department of Earth and Planetary Sciences at Harvard University, where he works with Professor Stein B. Jacobsen. His research focuses on isotope geochemistry and its applications to understanding Earth's evolution, including mantle processes, magmatic differentiation, crustal growth, ore formation, and the origin of plate tectonics. Before joining Harvard, he earned his B.S. in Geochemistry and M.S. in Geology from the China University of Geosciences, Beijing, where he developed expertise in high-precision stable isotope geochemistry.

His Lipman Research Award project, "Constraining the Initiation of Plate Tectonics Using Process-Sensitive Zircon Zr Isotope Systematics," explores how zirconium isotopes preserved in zircon can be used to distinguish different tectonic environments and investigate when modern-style plate tectonics first emerged on Earth. By combining high-precision zircon and whole-rock Zr isotope analyses with trace element geochemistry and quantitative modeling, the project aims to establish new geochemical criteria for interpreting Hadean and Archean zircons. This work will provide independent constraints on one of the most fundamental questions in Earth science: how and when Earth's lithosphere evolved into the modern plate tectonic system. The project also contributes to the development of new analytical methods and stable isotope tools for investigating deep-time geological processes.

Song plans to pursue an academic career in isotope geochemistry, developing innovative analytical techniques and applying them to fundamental questions in Earth and planetary evolution. He is particularly interested in using novel isotope systems to understand the formation of continents, mantle evolution, and the geological processes that have shaped Earth throughout its history.

