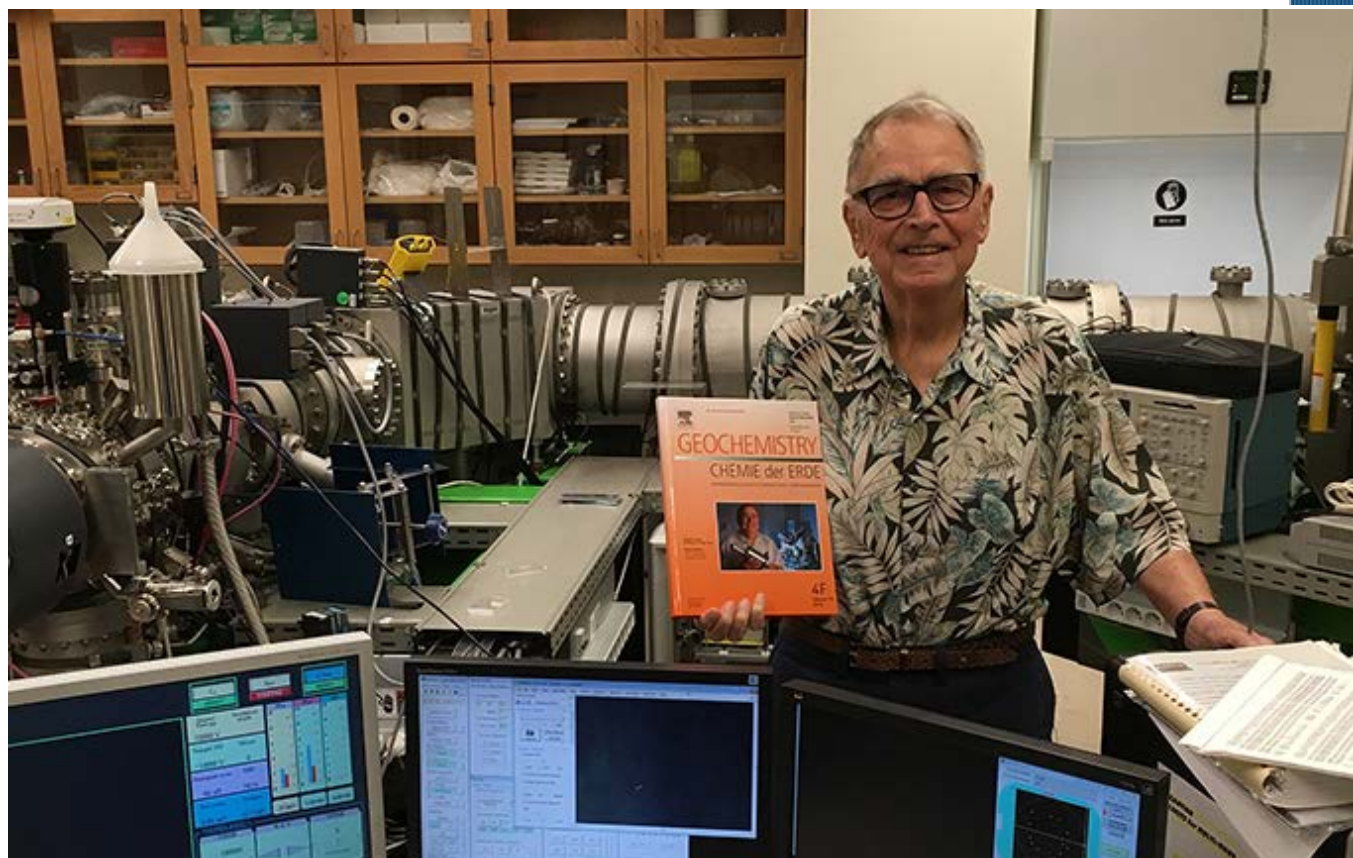


### ***Geochemistry Journal—Special Issue Honors Professor Klaus Keil***

A special issue of the international, peer-reviewed journal *Geochemistry* is dedicated to Klaus Keil (Emeritus Professor, University of Hawai‘i at Mānoa) on the occasion of his 85th birthday. As noted by editors Falko Langenhorst (University of Jena, Germany) and Sasha Krot (University of Hawai‘i at Mānoa) this special issue recognizes Klaus' "outstanding scientific achievements in meteoritics and cosmochemistry, and his tremendous accomplishments for the benefit of the journal *Chemie der Erde* (renamed *Geochemistry* in 2019)."



Klaus Keil holding a hard-cover copy of the special issue of *Geochemistry*, alongside the secondary ion mass spectrometer in the W. M. Keck Cosmochemistry Laboratory at the University of Hawai‘i at Mānoa. Photo credit: Hawai‘i Institute of Geophysics and Planetology, UH Mānoa.

The issue contains twenty articles (see list below) that span an impressive range of topics, all of which Klaus has worked on at one time or another: **Chondrites** and their components (**calcium-aluminum rich inclusions**, **chondrules**, rims around chondrules), differentiated **meteorites** (irons, acapulco-lodronites, HED meteorites and their parent **asteroid 4 Vesta**), and the composition and origin of the Moon and planets.

Klaus Keil pioneered the use of the electron microprobe in studying extraterrestrial materials, helping to introduce the geochemical community to this astonishingly useful tool. In the early 1960s, he worked with colleagues at NASA Ames Research Center, Ray Fitzgerald and Kurt Heinrich, to make the first

energy dispersive X-ray spectrometer for use in microanalysis. This device, pictured in Klaus' arms in the cover photo of the special issue, was the first to focus on terrestrial and extraterrestrial geological materials, and the first to use a solid state lithium-drifted Si detector. Such detectors are now used universally in electron microscopy and electron microprobe microanalysis. They, like Klaus Keil, are indispensable.

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Kerraouch, I., Ebert, S., Patzek, M., Bischoff, A., Zolensky, M. E., Pack, A., Schmitt-Kopplin, P., Belhai, D., Bendaoud, A., and Le, L. (2019) A light, chondritic xenolith in the Murchison (CM) chondrite – Formation by fluid-assisted percolation during metasomatism? *Geochemistry*, v. 79(4), doi: 10.1016/j.chemer.2019.06.002. [[view article](#)]

Krot, A. N., Ma, C., Nagashima, K., Davis, A. M., Beckett, J. R., Simon, S. B., Komatsu, M., Fagan, T. J., Brenker, F., Ivanova, M. A., and Bischoff, A. (2019) Mineralogy, petrography, and oxygen isotopic compositions of ultrarefractory inclusions from carbonaceous chondrites, *Geochemistry*, v. 79(4), doi: 10.1016/j.chemer.2019.07.001. [[view article](#)]

Lorenz, C., Ivanova, M., Krot, A., and Shuvalov, V. (2019) Formation of disk- and bowl-shaped igneous Ca,Al-rich inclusions: Constraints from their morphology, textures, mineralogy and modelling, *Geochemistry*, v. 79(4), doi: 10.1016/j.chemer.2019.07.005. [[view article](#)]

Matsuda, N., Sakamoto, N., Tachibana, S., and Yurimoto, H. (2019) Heating duration of igneous rim formation on a chondrule in the Northwest Africa 3118 CV<sub>3oxA</sub> carbonaceous chondrite inferred from micro-scale migration of the oxygen isotopes, *Geochemistry*, v. 79(4), doi: 10.1016/j.chemer.2019.07.006. [[view article](#)]

McSween Jr., H. Y., Raymond, C. A., Stolper, E. M., Mittlefehldt, D. W., Baker, M. B., Lunning, N. G., Beck, A. W., and Hahn, T. M. (2019) Differentiation and magmatic history of Vesta: Constraints from HED meteorites and Dawn spacecraft data, *Geochemistry*, v. 79(4), doi: 10.1016/j.chemer.2019.07.008. [[view article](#)]

Bischoff, A., Barrat, J.-A., Berndt, J., Borovicka, J., Burkhardt, C., Busemann, H., Hakenmüller, J., Heinlein, D., Hertzog, J., Kaiser, J., Maden, C., Meier, M. M. M., Morino, P., Pack, A., Patzek, M., Reitze, M. P., Rüfenacht, M., Schmitt-Kopplin, P., Schönbächler, M., Spurný, P., Weber, I., Wimmer, K., and Zikmund, T. (2019) The Renchen L5-6 chondrite breccia – The first confirmed meteorite fall from Baden-Württemberg (Germany), *Geochemistry*, v. 79(4), doi: 10.1016/j.chemer.2019.07.007. [[view article](#)]

Rubin, A. E., and Li, Y. (2019) Formation and destruction of magnetite in CO<sub>3</sub> chondrites and other chondrite groups, *Geochemistry*, v. 79(4), doi: 10.1016/j.chemer.2019.07.009. [[view article](#)]

Krot, A. N., Nagashima, K., Simon, S. B., Ma, C., Connolly Jr., H. C., Huss, G. R., Davis, A. M., and Bizzarro, M. (2019) Mineralogy, petrography, and oxygen and aluminum-magnesium isotope systematics of grossite-bearing refractory inclusions, *Geochemistry*, v. 79(4), doi: 10.1016/j.chemer.2019.08.001. [[view article](#)]

Alfing, J., Patzek, M., and Bischoff, A. (2019) Modal abundances of coarse-grained (>5µm) components within CI-chondrites and their individual clasts – Mixing of various lithologies on the CI parent body(ies), *Geochemistry*, v. 79(4), doi: 10.1016/j.chemer.2019.08.004. [[view article](#)]

King, A. J., Bates, H. C., Krietsch, D., Busemann, H., Clay, P. L., Schofield, P. F., and Russell, S. S. (2019) The Yamato-type (CY) carbonaceous chondrite group: Analogues for the surface of asteroid Ryugu? *Geochemistry*, v. 79(4), doi: 10.1016/j.chemer.2019.08.003. [[view article](#)]

McCoy, T. J., Corrigan, C. M., Dickinson, T. L., Benedix, G. K., Schrader, D. L., and Davidson, J. (2019) Grove Mountains (GRV) 020043: Insights into acapulcoite-lodranite genesis from the most primitive member, *Geochemistry*, v. 79(4), doi: 10.1016/j.chemer.2019.125536. [[view article](#)]

Jansen, C. A., Brenker, F. E., Zipfel, J., Pack, A., Labenne, L., Nagashima, K., Krot, A. N., Bizzarro, M., and Schiller, M. (2019) Mineralogy, petrology, and oxygen isotopic composition of Northwest Africa 12379, metal-rich chondrite with affinity to ordinary chondrites, *Geochemistry*, v. 79(4), doi: 10.1016/j.chemer.2019.125537. [[view article](#)]

Nolze, G. and Heide, K. (2019) Roaldite in the iron-meteorite São Julião de Moreira, *Geochemistry*, v. 79(4), doi: 10.1016/j.chemer.2019.125538. [[view article](#)]

Gellissen, M., Holzheid, A., Kegler, Ph., and Palme, H. (2019) Heating experiments relevant to the depletion of Na, K and Mn in the Earth and other planetary bodies, *Geochemistry*, v. 79(4), doi: 10.1016/j.chemer.2019.125540. [[view article](#)]

Ross, A. J., Downes, H., Herrin, J. S., Mittlefehldt, D. W., Humayun, M., and Smith, C. (2019) The origin of iron silicides in ureilite meteorites, *Geochemistry*, v. 79(4), doi: 10.1016/j.chemer.2019.125539. [[view article](#)]

Schmidt, D., Pollok, K., Matthäus, G., Nolte, S., and Langenhorst, F. (2019) Nanodeformation in enstatite single crystals: Simulation of micrometeoroid impacts by femtosecond pulsed laser experiments, *Geochemistry*, v. 79(4), doi: 10.1016/j.chemer.2019.125542. [[view article](#)]

Pang, R.-L., Harries, D., Pollok, K., Zhang, A.-C., and Langenhorst, F. (2019) Unique mineral assemblages of shock-induced titanium-rich melt pockets in eucrite Northwest Africa 8003, *Geochemistry*, v. 79(4), doi: 10.1016/j.chemer.2019.125541. [[view article](#)]

Han, J., Jacobsen, B., Liu, M.-C., Brearley, A. J., Matzel, J. E., and Keller, L. P. (2019) Origin of <sup>16</sup>O-rich fine-grained Ca-Al-rich inclusions of different mineralogy and texture, *Geochemistry*, v. 79(4), doi: 10.1016/j.chemer.2019.125543. [[view article](#)]

Desch, S. J. and Robinson, K. L. (2019) A unified model for hydrogen in the Earth and Moon: No one expects the Theia contribution, *Geochemistry*, v. 79(4), doi: 10.1016/j.chemer.2019.125546. [[view article](#)]

Scorzelli, R. and dos Santos, E. (2019) Meteoritic Fe-Ni alloys: A review of <sup>57</sup>Fe Mössbauer spectroscopy studies, *Geochemistry*, v. 79(4), doi: 10.1016/j.chemer.2019.125547. [[view article](#)]

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