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A ~4.16 Ga impact event on the Moon recorded by lunar meteorite NWA 5000

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To asses the lunar impact flux, it is crucial to date large-scale impacts. Such an event might have formed the gabbroic clast material in lunar meteorite NWA 5000 [1] between 3.2 and 4.2 Ga [2,3]. To better constrain its crystallization age, we performed sequential leaching of ~0.2 g of the gabbroic material with different acids, obtaining seven fractions from which Pb was separated for isotope ratio measurements [4,5,6]. A preliminary four point Pb-Pb isochron yielded a ~4.16 Ga date. Crystallization at this time is in line with the 4.1-4.2 Ga age of an impact melt-forming event proposed by [2] on the basis of a Sm-Nd model age, but is significantly older than the 3.2 ±0.1 Ga age [3] based on disturbed $^{40}Ar/^{39}Ar$ spectra. The sample's initial Pb is concordant with a 'Feldspathic Highland Terrane'-like target rock [2] and thus might date an event not recorded by the Apollo samples.

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Cite abstract as:
Haber, T., Scherer, E.E., Worsham, E., Kleine, T. (2021) A ~4.16 Ga impact event on the Moon recorded by lunar meteorite NWA 5000. Paneth Kolloquium, Online (Germany), abstract URL: https://paneth.eu/PanethKolloquium/2021/0027.pdf (abstract #0027).