

Claude Allègre – his ideas, discoveries and scientific legacy

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Claude Allègre was more than an intellectual giant of geochemistry. But he was indeed an intellectual giant, defining forefronts in radiogenic isotope and noble gas geochemistry for many years. He made stunning discoveries such as the non-atmospheric composition of Ne and Xe in the MORB source, or extinct ^{53}Mn in the early Solar System, for example. He also made the first isotopic measurements of Nd in basalts, pioneered single grain U-Pb zircon, and first applied Os isotopes to the mantle. Then he turned his scientific mind to many more areas, including the origins of granites, growth of the continents, the critical zone, erosion and sedimentary systems, and Os in the oceans. Indeed, some of his breakthrough papers were in completely distinct fields like the physics of magma chambers. He will be remembered as much though for his insightful and impactful models and paradigms, such as his work describing how the atmosphere formed, or the “chemical geodynamics” of the two-layer mantle. He provided the frameworks within which he and others could develop new thinking and explain how the Earth functioned. He defended those frameworks, particularly against those who proposed alternative but largely untestable proposals for Earth’s behavior. He will be remembered as a visionary leader of the geosciences and science more broadly in Europe. But above all, he was an astonishingly creative intellect whose scientific legacy was multiple important discoveries and whose vision, and ability to think through a problem, led to the transformation of the field of geochemistry.