

Hidden life in caves: The bio-mediated mineral deposits of Asperge cave (France) and Breezeway Cave (Colorado)

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Abstract: Mineral deposits from caves are of interest to mineralogists and material scientists and, because they grow under extreme conditions and can be preserved for billions of years in ancient rocks, they might represent a novel biosignature in the search for early life on Earth and on other planets. Caves also represent a perfect “playground” for future space missions seeking life on other planets. The fascinating mineral structures of Asperge cave in France and Breezeway in Colorado have remained hidden and unstudied for years. Here, we show that by using an integrated approach, including field work coupled with laboratory analyses, we unveiled details about the formation of these mineral structures demonstrating that a distinct microbial community influences their genesis. Similar mineral structures may be more common than currently assumed and, hitherto, nobody realized that they represent a biological construction rather than a “simple-inanimated” mineral.