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RECOVERY AND PLANNED STUDY OF THE SAINT-PIERRE-LE-VIGER METEORITE: AN ACHIEVEMENT OF THE FRIPON/VIGIE-CIEL CITIZEN SCIENCE PROGRAM.

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Introduction: Asteroid 2023 CX₁ was discovered by Krisztián Sárneczky of Konkoly Observatory on February 12, 2023, only 7 hours before it encountered the Earth, which made it possible to track it and calculate its orbit very precisely. The potential strewnfield was determined in parallel by several groups and quickly released (e.g.: <https://www.imo.net/the-atmospheric-trajectory-of-2023-cx1-and-the-possible-meteorite-strewn-field/>). The FRIPON/Vigie-ciel collaboration quickly mobilized its network to set up a field search campaign. An initial team of researchers and amateur enthusiasts met on the morning of February 15 in the fall zone identified by the international teams. On the programme: information for local resident access authorizations, meetings with mayors, scouting out favorable sites, and initial field research. At 4:47 pm on February 15 the eyes of Loïs Leblanc, an 18-year-old art school student and member of the FRIPON/Vigie-Ciel team, were caught by a dark stone barely above the ground in a field located in the commune of Saint-Pierre-le-Viger (Seine Maritime), soon identified as the meteorite that we were searching for. The stone weighed 94 g and, during the following days and weeks, 10 more stones, weighing between 2 and 24 g, completed our harvest of extraterrestrial matter.

The FRIPON/Vigie-Ciel project: The FRIPON/Vigie-Ciel program is supported by the Muséum National d'Histoire naturelle, Observatoire de Paris, Université Paris-Saclay, and OSU-Pythéas. Its objectives are scientific research into meteors, meteorites, and impact craters by involving the general public. It is based on the observation that meteorites in France have always been recovered by the general public. FRIPON is a fireball observation network [1] which now covers France and is developing mainly in Europe and in Canada (www.fripon.org). It detects meteors and allows us to calculate meteorite strewn fields. Because of the need to search everywhere, including on private land, it is important that the general public be aware of the value of meteorites as a scientific and cultural inheritance, and be willing to help us find them on the ground. Vigie-Ciel (www.vigie-ciel.org) is the citizen science counterpart of the FRIPON network. It invites members of its network (scientists, journalists, teachers, amateurs...) and local residents to contribute to the search for meteorites in the field – these constitute the FRIPON/Vigie-Ciel teams. As participation is more effective if the people involved are informed and trained, the Vigie-Ciel program also aims to contribute to scientific education on meteors, meteorites, impact craters and, more generally, in planetary science. Scientists from the Vigie-Ciel team returned to the area two months after the fall to give a public lecture and meet the local inhabitants, an approach that was much appreciated and constitutes for the team an essential part of making this project successful.

The Saint-Pierre-le-Viger meteorite: Most of the stones found by the FRIPON/Vigie-Ciel project are now on display at the Muséum national d'Histoire naturelle (Paris, France) after being sampled for scientific study. The meteorite has been approved by the Nomenclature Committee of the Meteoritical Society under the name Saint-Pierre-le-Viger and is classified as an L5-6 breccia with an S3 shock stage, highlighted by numerous shock veins in which the high-pressure phase albitic jadeite was identified using micro-Raman spectroscopy [2]. Stones from different areas of the strewnfield, hence possibly from different depths within the 2023 CX₁ meteoroid have been sampled and are now being analyzed for cosmogenic rare gases and radionuclides as well as gas retention ages, so that these data can be compared to the astronomical observations of the orbit and terrestrial entry and fragmentation.

References: [1] Colas F. et al. (2020) *Astronomy and Astrophysics* 644:A53; [2] Ferrière L. and Baziotis I. (2023), *this conference*.