

**The 2012-2013 Joint Field Campaign for Collecting Meteorites in Antarctica: an Efficient Collaboration between Japan and Belgium.** V. Debaille<sup>1</sup>, N. Imae<sup>2</sup>, A. Yamaguchi<sup>2</sup>, S. Goderis<sup>3</sup>, T. Mikouchi<sup>4</sup>, W. Debouge<sup>1</sup>, G. Hublet<sup>1</sup>, N. Van Roosbroek<sup>1</sup>, H. Zekollari<sup>3</sup>, H. Kojima<sup>2</sup>, Ph. Claeys<sup>3</sup>, <sup>1</sup>Laboratoire G-Time, Université Libre de Bruxelles, Brussels, Belgium. <sup>2</sup>National Institute of Polar Research, Tachikawa, Japan. <sup>3</sup>Earth Science Systems, Vrije Universiteit Brussel, Brussels, Belgium. <sup>4</sup>Department of Earth and Planetary Science, University of Tokyo, Tokyo, Japan. (e-mail address: vinciane.debaille@ulb.ac.be)

### Introduction:

For the last 5 years, Belgium and Japan have joined forces, logistics and knowledge to organize three successful meteorite expeditions in Antarctica. The first joint JARE 51 mission sampled the Balchen Ice Field, in the eastern Sør Rondane Mountains region, in 2009-2010 and recovered more than 600 meteorites. The second joint BELARE SAMBA 2010-2011 on the North-West part of the Nansen Ice Field (area A, Fig. 1), located to the South of Sør Rondane Mountains, recovered 220 meteorites (Fig. 2). Finally, this year, a third JARE 54 - BELARE SAMBA 2012-2013 joint expedition has been organized in the Nansen Ice Field during the austral summer 2012-2013. This was the largest recovery party organized, with a total of 10 members searching for meteorites. On the Belgian side, this program is funded by the Belgian Science Policy (BELSPO) and benefits from the logistic support of the International Polar Foundation (IPF).

The meteorite search team consisted of 5 Belgian scientists from Université Libre de Bruxelles (ULB) and Vrije Universiteit Brussels (VUB), a field guide provided by the IPF, and 3 Japanese scientists from the National Institute of Polar Research (NIPR) and University of Tokyo, and a field guide from NIPR.

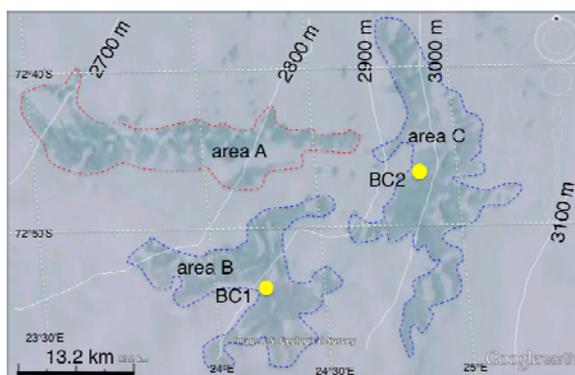


Figure 1: Nansen Ice Field subdivided in 3 parts: Area A (season 2010-2011), Area B (season 2012-2013), and Area C (partially done during the season 2012-2013). BC2 has been moved from this previous location. Map from N. Imae

### Base camps and meteorite search:

Considering the shape of the Nansen Ice Field (Fig. 1), it has been decided to divide the 2012-2013 campaign in two, implying two different base camps

(BC1 and BC2 on Fig. 1) located in the not yet sampled areas (B and C). All the logistics (including living containers, fuel, personal belongings, ...) were dropped off on the Nansen Ice Field Plateau on December 24 2012 by the IPF team, led by Alain Hubert. Then, the full team followed by snowmobile on December 26th 2012, when the base camp was installed, and weather acceptable. Systematic searches by skidoo were carried out from the 27th of December 2012 to the 13th of January 2013, whenever the weather was permitting (see weather conditions subsection below), and covered the entire zone B of the Nansen Ice Field. The base camp B was moved to the second area on the 15th of January 2013. There, weather degraded and searches were possible only from the 28th to the 30th of January. The team finally left the camp on the 2nd of February 2013, back to the Princess Elisabeth Station. Typically, after a first briefing in the morning to evaluate weather conditions, search started around 12 PM. Normal search-day consisted of only 4 to 6 hours in the field due to the severe weather conditions.

### Weather conditions:

The weather conditions were harsh, even for the South Pole and determined the daily schedule as such. Notable difference exists between base camp BC1 and BC2 (data from T. Mikouchi and A. Yamaguchi). At camp BC1, absolute temperature ranged from -14.4 to -22.4°C (average of -18.2°C), with an average wind speed of 10.1 m/s, resulting in average wind chill corrected temperature of -31.0°C. At base camp BC2, absolute temperature ranged from -18.2 to -27.1°C (average of -21.9°C), with an average wind speed of 10.6 m/s, resulting in average wind chill corrected temperature of -36.0°C, notably lower than Area B. It is difficult to know whether tougher conditions were met in Area C because it was later in the season, or because of a slightly higher altitude (~100 m between the two base camps), or less sheltering.

In average, half of the time on the plateau was lost due to weather conditions. This is similar to the 2010-2011 campaign. However, the main difference is the repartition of bad weather days. While during the 2010-2011 season, bad weather days were distributed over a short period (every 3-4 days), during the 2012-2013 season, longer periods were observed, with 15 days in a row of good weather, and 12 days in row of bad weather.

### **Preliminary results:**

During the 2012-2013 season, 427 meteorites were recovered (Fig. 2), for a total weight of 65.2 kg. Notably, the largest sample weighs 18.1 kg, and 9 meteorites are over 1 kg. A few achondrites have been observed when fusion crusts were partially absent (possibly eucritic), as well as a few carbonaceous chondrites.

First, the meteorites were sent to NIPR for careful defreezing. The large samples will be cut in two, and shared evenly between Japan and Belgium. After detailed classification made by both NIPR and ULB-VUB teams, including the Royal Belgian Institute for Natural Sciences (RBINS), one half will come back to Belgium where they will be available for research by the international scientific community. In addition, the most beautiful pieces will be exposed to the public at the RBINS. Scientific research will be performed on those samples, in close collaborations between NIPR and ULB-VUB teams.

### **Curation of meteorites:**

Belgium has recently developed a meteorite curation center at the RBINS where the Belgian share of the Antarctic meteorites will be stored and curated based on sample requests made by researchers.

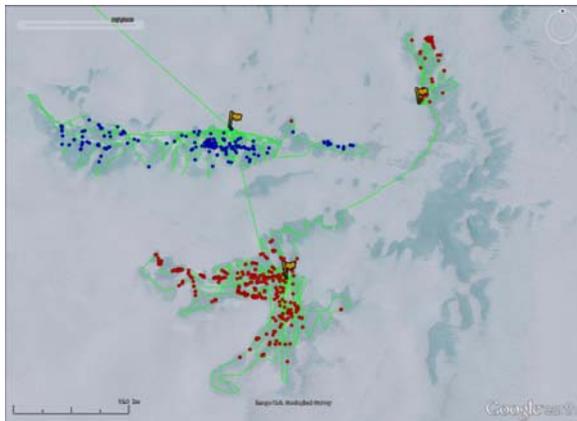


Figure 2: Summary of collected meteorites on Nansen Ice Field, during the two campaigns (blue: 2010-2011; red: 2012-13). Tracks followed by the team are in green. Orange flags indicate base camps.