

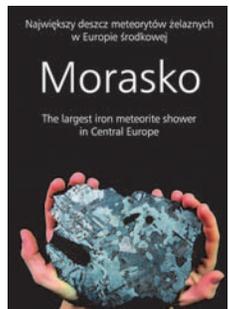


# Mineralogical Society of Poland

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## MORASKO: THE LARGEST IRON METEORITE SHOWER IN CENTRAL EUROPE\*

The Morasko meteorite, discovered in 1914, is one of the most famous iron meteorites (IAB-MG). It is well known for its large strewn field and its particular chemical composition and mineralogy. It attracts much attention from scientists, a growing number of meteorite collectors, and the general public. During the last two decades, many new finds of Morasko have been reported, inspiring new scientific investigations. The recent state of knowledge of the Morasko iron is outlined in the monograph *Morasko: The Largest Meteorite Shower in Central Europe*, edited by A. Muszyński, R. Kryza, Ł. Karwowski, A.S. Piłski, and J. Muszyńska, and coauthored by P. Drożdżewski, M. Dworzyńska, A. Gurdziel, K. Helios, R. Jakięła, M. Nowak, A. Pack, M. Raith, E. Słaby, and W. Stankowski. The monograph, nicely produced by Bogucki Wydawnictwo Naukowe, Poznań, is an overview of recent studies carried out as part of a research project of the Ministry of Science and Higher Education of Poland: Morasko, Przełazy, Jankowo Dolne – a meteorite shower, NN 307 3533/33, 2007-2012. The project was carried out by a team of scientists from several Polish and foreign scientific institutions and was coordinated by Andrzej Muszyński of Adam Mickiewicz University, Poznań.



The book does not present systematically all detailed results of recent investigations of Morasko published as extensive research papers. Rather, it presents, in an easily read format, the most important achievements and interpretations of recent studies that have been (or are being prepared to be) published as separate, regular papers.

The first two chapters of the monograph, the Introduction and Historical Notes, provide interesting details about the discovery of Morasko and the three similar, and probably related, irons of Przełazy (Seeläsgen), Jankowo Dolne, and Tabarz (Fig. 1). Chapter 3, Iron Meteorite Shower Morasko, Przełazy, Jankowo Dolne, outlines the geological setting and provides field observations on the Morasko craters and the reconstructed strewn field. It also reviews ideas concerning the fall, including the favored hypothesis of a single, large iron meteorite shower. The following four chapters summarize the geochemistry, petrology, mineralogy, and Raman



**FIGURE 2** The new main mass of Morasko: Memorss meteorite, 261.2 kg (21 × 30 cm), found on October 8, 2012

spectroscopy and isotopic data on Morasko and the paired irons. Two additional chapters are devoted to micrometeorites and weathering of the meteorites. Chapter 10 is a short report on recent meteorite prospecting and new discoveries in the Morasko meteorite reserve. The monograph is completed by an extensive photo gallery, which documents historical and recent finds of the Morasko, Przełazy, and Jankowo Dolne irons, as well as meteorite prospecting and technical works.

Several important conclusions can be derived from the new data overviewed in the Morasko monograph:

1. Morasko and the similar irons of Przełazy, Jankowo Dolne, and possibly Tabarz represent a single, large meteorite shower (the total mass of all finds is estimated at over 1500 kg) that occurred at around 5000 BP. These conclusions are based on the size and shape of the strewn field ellipse, field evidence, petrology, mineralogy, chemistry, and geochronological data.

2. Morasko and the paired irons show unique chemical features, for example, low Ir and Cu concentrations; these features assign them to a special group within the IAB-MG irons. They also have an extraordinary mineralogy, in particular, frequent graphite-troilite nodules; these contain many accessory minerals, such as rare phosphates, a few of which display compositions that have not yet been reported either from the Earth or from extraterrestrial rocks.

The monograph was printed soon after the discovery of the new main mass of Morasko (Fig. 2; see *Elements*, volume 9, 2013, page 152) by meteorite prospectors Magda Skirzewska and Łukasz Smuła on October 8, 2012. The excavation works were coordinated by Andrzej Muszyński and assisted by Pierre Rochette and a group of Polish scientists and meteorite hunters. This mass, named Memorss (from Meteorite Morasko of Smuła and Skirzewska) is an oriented meteorite, 261.2 kg in weight after cleaning, and the largest meteorite ever found in Poland (and, apparently, the fourth-largest iron in Europe).

The new record find and several other large masses discovered in the past decade have increased the general public's interest in meteoritics. Many reports have been published in the mass media, and two films have been produced by the film studio of AMU Poznań and one as part of the series *Meteorite Men of Discovery Science* (Steve Arnold and Geoffrey Notkin). The Morasko research team received an award from *National Geographic Traveller* as the scientific discovery of the year 2012 in Poland.

The Morasko monograph has been technically edited with care. The text is presented in two parallel columns, in Polish and English. Many high-quality photographs and diagrams provide valuable documentation of the meteorites. Specific scientific points are explained in special boxes inserted into the main text. These editorial features should make reading the book easy and pleasurable. The book will appeal to all those interested in meteorites, but especially to meteorite collectors. It will also be useful to scientists working on meteorites, although to get more detailed data from recent studies on the Morasko iron shower, they would need to access regular research papers.

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**FIGURE 1** Location of the Morasko and paired irons in Central Europe (modified after Czajka 2005)

\* Muszyński A, Kryza R, Karwowski Ł, Piłski AS, Muszyńska J (eds) (2012) *Morasko: The largest iron meteorite shower in Central Europe*. Bogucki Wydawnictwo Naukowe, Poznań, ISBN 978-83-63400-50-7, 111 pp