Museum of Geology and Mineralogy of I.V. Bel'kov
(Geological Institute of the KSC RAS): on the threshold of the 90th anniversary

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Abstract. Museum of Geology and Mineralogy of I.V. Bel'kov of the Geological Institute (GI) of the Kola Science Centre of the RAS is located in Apatity city, Murmansk region, in the FRC KSC RAS building. Officially, the Museum GI was created in 1957, although it has been leading its history since the 30s of 20th century. The history of the Museum is closely connected with the names of such outstanding researchers of the Kola North as academician A. E. Fersman and doctor of geological and mineralogical sciences I. V. Bel'kov. In 2009, the Museum was named after I. V. Bel'kov. The exposition of the Museum is the most complete collection of minerals and rocks of the Kola region. Among them are rare and new minerals, which are unique in their association, forms of crystal, sizes and beauty of colors. This give a great value to the collections and arouse great interest of visitors. Samles of minerals and rock come to Museum from different geological objects in the Kola region exclusively: Khibiny and Lovozero, Kovdor, Keivy, Pechenga etc. The presented samples of minerals, rocks and ores allow us to estimate the richness and diversity of the stone world of the Kola region. The Museum workers are engaged not only in accounting, but also in scientific and educational activities. Constant work with old collections leads to the discovery of previously unknown minerals in the region, and with the participation of employees of the GI CSC RAS, new mineral species are discovered. Every five years there is a "Catalogue of mineral species of the Kola region", which is constantly updated. In 2020, it will be 90 years since the formation of the first Museum of geology and mineralogy in the Kola region.

1. Introduction

The Kola North has always attracted the attention of researchers. However, the systematic study and evaluation of industrial potential began after one famous event associated with the name of one of the main Khibiny researchers. In the summer of 1920, a special Commission, which included academician A. E. Fersman, went by rail to Murmansk. During technical parking lot of the trains, Fersman, while walking on Maly Mannepahk mt., found an amazing mineral samples, which he are not met up to this point. In the same year, Fersman organized a full-fledged expedition to the Khibiny, and in 1922 one of the participants of the subsequent expedition, A. N. Labuntsov discovered placers of apatite, which began the industrial development of Khibiny [1].

July 19, 1930 on the picturesque shore of lake Maly Vudjav (Fig.1, a), under the leadership of academician A. E. Fersman, the Khibiny scientific station of the USSR Academy of Sciences was
opened - the first complex scientific institution in the Murmansk district and the first peripheral institution of the USSR Academy of Sciences.

![Figure 1. Space picture of the Khibiny mountains. Fragments: (a) - the location of the memorial "Tietta"; (b) - building FRC CSC RAS (Google Maps).](image1)

It was a small but comfortable wooden house (Fig. 2). Along with the library, botanical garden and various laboratories, from the first days of the scientific station, in its composition, a Museum was organized on the first floor. It occupied one small room and consisted of two sections: mineralogical-petrographic and soil-botanical. Fersman himself called the station "Tietta", which means "knowledge, science" from the Lappish language. Fersman himself said about the station: "In memory of our struggle for the Khibiny and their future, we are building a beautiful mountain scientific station on the shore of the Maly Woodjavr, under the overhanging rocks of Poachvumchorr. We want it to unite the workers of science and practice and to continue to serve as a symbol of the path that leads from science to life."

![Figure 2. The building of the mountain station "Tietta" (the left) and the first mineralogical collection in the Museum of "Tietta" (the right). Archival photos.](image2)

Unfortunately, during the Great Patriotic War (1941-1945), in the 40s, the station "Tietta" was destroyed by fire. The restoration of the Museum began in the post-war years and by 1951 new samples of minerals, rocks and ores of the Kola region were collected.
In 1951, the Geological Institute was organized, and in 1957, according to the decree of the Presidium of the USSR Academy of Sciences (fig.1, b), the Museum became part of the Geological Institute of the Kola branch of the USSR Academy of Sciences, now Kola research center.

2. Museum of GI KSC RAS then
A lot of effort in the education and development of the Museum has invested by honored worker of science, doctor of geological-mineralogical sciences, Igor Vladimirovich Bel'kov (1917-1989), who for a quarter of a century headed the Geological Institute, and more than forty years he directed the mineralogical studies within GI [2] (fig. 3). In honor of this remarkable man named mineral bel'kovite Ba₃Nb₆(Si₂O₇)₂O₁₂, opened in the Vuorijarvi carbonatite massif [3]. Scientific interests of I. V. Belkov covered the fields of geology and geochronology of the Baltic shield, petrology and metallogeny of granites, genesis of metamorphic rocks, technological mineralogy of kyanite and rare-metal raw materials. But I. V. Bel'kov paid special attention to the Museum of Geological Institute, constantly taking care of its equipment and acquisition [2].

The program of the field expeditions of the Institute geologists necessarily included the task to collecting samples for the Museum. I. V. Bel'kov gave to his colleagues in the Institute a passion for the Museum, the desire to make it a hotbed of culture, to give people full information about the mineral wealth of the Kola Peninsula.

![Image](image1.png)

**Figure 3.** Igor Vladimirovich Bel'kov - honored scientist of the RSFSR, doctor of geological-mineralogical science (right), together with T. N. Ivanova in the Museum of the Geological Institute (late 1960-ies.).

A great contribution to the development of the Museum made I. V. Bel'kov's colleagues, T. V. Novokhat'skaya and M. G. Fedotova, at different times they were in charge of the Museum. Under the leadership of I. V. Bel'kov, they have achieved that the Museum became known not only in our country but also abroad. Currently, the Museum performs educational work: students of geological, ecological and geophysical specialties of various universities of Apatity city are trained on the basis of the Museum. Collections of I. V. Bel'kov help them in obtaining knowledge on mineralogy, petrography and minerals of the Kola region. By the decision of the scientific Council of the Geological Institute in 2009 the Museum was named after I. V. Bel'kov.

3. Museum of GI KSC RAS now
Since the establishment of the Museum in the Kola science center, it still occupies a large hall on the fifth floor of the building (Fig. 4).
Figure 4. Exhibition hall of the Museum of GI KSC RAS (2012). Photo from GI KSC RAS website (http://geoksc.apatity.ru/)

Museum worker conducted not only collection and accounting activities, but also constantly working with old collections of former employees of the Institute. These collections store a lot of valuable information. Thus, during the audit of the samples of the Museum main fund in 2016, in one of the samples from the vein of Alakurtti district granite pegmatites (collection of E. I. Nefedov), for the first time for Russia and the Kola region was established nanibite \( \text{Cu(BiO)}_2(\text{VO}_4)(\text{OH}) \) \(^4, 5\). By Nefedov this mineral was described as beyerite - bismuth carbonate. It is noteworthy that the Nefedov collection dates on 1966, and nanibite, as a new mineral, was discovered only in 1981 \(^6\).

A separate place in the exposition of the Museum have a small collection of core samples from the Kola superdeep borehole is the greatest achievement of the Union of Soviet scientists and drillers of the 20th century.

The Museum and its stock storage facilities, at the end of 2018, collected more than 9,000 samples of minerals, ores and rocks of the Kola Peninsula. The exposition of the Museum is presented by:

- Systematic collection of minerals;
- Collection of ores and other minerals;
- Collection of rocks;
- Collection of new minerals, first discovered in the Kola Peninsula.

These collections represent the most complete collection of minerals of the Kola Peninsula. Among them - rare and new minerals, unique in associations, forms of allocation, beauty of color schemes and the sizes which give great value to collections and cause huge interest of visitors.

The systematic collection of minerals includes more than 1200 samples arranged in showcases by classes: native elements, sulfides, halides, carbonates, sulfates, oxides and hydroxides, phosphates and silicates. The value of the most representative exposition of minerals from Khibiny and Lovozero massifs is determined not only by their beauty and diversity, but also by the fact that many of them are mineralogical rarity.

Every five years, the Museum workers publishe a "Catalogue of mineral species of the Kola region", which provides the most complete list of mineral species of the Kola region by class. According to the latest edition \(^7\), the list of minerals first discovered in the Kola region contains 271 names and is arranged in chronological order. Since 2015, this list has been replenished with new mineral species discovered in the region and named in honor of the employees of the Geological Institute. For example, in honor of the wife of I. V. Bel'kova - Iya Dmitrievna Bitieva, in 2016, new mineral is named "batievaite-(Y)" which was opened in the pegmatites of the Sakharjok massif \(^8\).
honor of the talented scientist Ekaterina Selivanova mineral "selivanovaite" was named, opened in Lovozero massif [9]. Mitrofanovite which was opened in East Chuarovy deposit, in Fedorovo-Pansky massif, named in honor of academician and former Director of GI KSC RAS F. P. Mitrofanov [10]. In 2020, a new "Catalogue..." will be issued, which will sum up the 90-year activity of the keepers of mineral wealth of the Kola region.

Minerals from those first discovered on the Kola Peninsula, on display in the exhibition hall of the Museum, 85 minerals discovered by employees of the Geological Institute - A.V. Voloshin, Y. P. Menshikov, I. V. Bussen, V. V. Subbotin, V. N. Yakovenchuk, Y. A. Pakhomovsky, G. Yu. Ivanyuk, and others.

4. Conclusion
In 2020, it is exactly 90 years since the formation of the first mineralogical Museum in the Kola region. The Museum, for various reasons, changed its location, it was led by various talented scientists, it is constantly expanding, and the exhibition was replenished with new unique samples from all over the region. Every year the Museum is visited by about 1000 people. Among them are those who devoted their lives to geology and mineralogy, and just connoisseurs and lovers of the beauty of the stone. For almost a century, the Museum has been performing its main function - saving, storing and transferring to the future generation of geologists and mineralogists all those valuable collections and knowledge that were accumulated by the work and knowledge of outstanding scientists who studied the richest Kola region in different years.

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References
[1] Il'in G S 2018 History of geological exploration of Khibiny in the XIX - beginning of the XX centuries: short revision Proceeding of Fersman scientific session of GI KSC RAS 15 12-15 (in Russian)
[2] Makarova E I 2017 Igor Vladimirovich Bel'kov in history of the Kola north: to 100 years from Birthday Proceeding of Fersman scientific session of GI KSC RAS 14 37-42 (in Russian)
[3] Voloshin A V et al 1991Bel'kovite - a new barium-niobium silicate from carbonatites of the Vuoriyarvi massif (Kola Peninsula, USSR) Neues Jahrbuch für Mineralogie, Monatshefte 23-31
[4] Borisova V V et al 2018 Namibite from the Alakurtti pegmatites (Kola region) Zapiski RMO 147(3) 59-68 (in Russian)
[5] Voloshin A V et al 2017 New data on minerals. V. 3. First finds in Russia and in the Kola region Proceeding of Fersman scientific session of GI KSC RAS 14 71-77 (in Russian)
[6] Von Knorring O and Sahama T G 1981 Namibite, a new copper-bismuth-vanadium mineral from Namibia Schweiz. Miner. Petrog. Mitt. 61 7-12
[7] Borisova V V and Voloshin A V 2015 Catalogue of mineral species of Kola Peninsula. 5th edition, corrected and added - Apatity: Geological Institute KSC RAS Kola Branch of RMS 124 p.
[8] Lyalina L M et al 2016 Batievaite-(Y), Y3Ca2Ti([Si2O7]2)(OH)2(H2O)4, a new mineral from nepheline syenite pegmatite in the Sakharjok massif, Kola Peninsula, Russia Mineralogy and Petrology 110(6) 895-904
[9] Pakhomovsky Y A et al 2018 Selivanovaite, NaTi3(Ti,Na,Fe,Mn)2[([Si2O7]2)·O2(OH,H2O)4]·nH2O, a new rock-forming mineral from the eudialyte-rich malignite of the Lovozero alkaline massif (Kola Peninsula, Russia) European Journal of Mineralogy 30 (3) 515-523
[10] Subbotin V V et al 2018 Mitrofanovite, IMA 2017-112 CNMNC Newsletter No. 42 April 2018 page 450; Mineralogical Magazine 82 445–451