however, when the Germans invaded the city. During the occupation Banach worked as a feeder of lice at the Rudolf Weigl Institute, which produced anti-typhus vaccines. This work gave him relatively "safe" documents.

⬤ After WWII Banach was offered a Chair at the Jagiellonian University in Kraków. Sadly, the professor did not manage to take it because he died of cancer at the end of August 1945. Stefan Banach was laid to rest at the Łyczakowski Cemetery.

Professor Wiesław Żelazko
Institute of Mathematics
Polish Academy of Sciences

⬤ On **3 April 2012**, the National Bank of Poland is putting into circulation coins commemorating Stefan Banach, with the following values:

200 zł struck in proof finish in gold,

10 zł struck in proof finish in silver,

2 zł struck in standard finish in the Nordic Gold alloy.

The National Bank of Poland

holds the exclusive right to issue the currency

of the Republic of Poland.

In addition to coins and notes for general circulation, the NBP issues collector coins and notes.
Issuing collector items is an occasion to commemorate important historic figures and anniversaries, as well as to develop the interest of the public in Polish culture, science and tradition.

Since 1996, the NBP has also been issuing occasional 2 złoty coins, struck in Nordic Gold, for general circulation.

All coins and notes issued

by the NBP are legal tender in Poland.

On 26 April 2012 the National Bank of Poland
is going to put into circulation the coin
"Polish Navy Ships – Błyskawica Destroyer"
with the face value of 2 zł (Nordic Gold).

Information on the issue schedule can be found at:
www.nbp.pl/monety
website.

Collector coins issued by the NBP
are sold at the Internet auctions held
in the Kolekcjoner service at the following website:
www.kolekcjoner.nbp.pl

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and at the Regional Branches of the NBP.

The coins were struck at the Mint of Poland in Warsaw.
Edited and printed: NBP Printing Office

NBP
National Bank of Poland

coins

Stefan Banach

(1892-1945)

Stefan Banach (1892-1945)

Stefan Banach (1892–1945) was the greatest Polish mathematician and co-founder of the famous Polish School of Mathematics developed in the interwar period of 1918-1939. One of the major prizes of the Polish Mathematical Society (which he co-founded and chaired in the years 1939–1945) and the medal of the Polish Academy of Sciences awarded alternately to either a Polish or a foreign mathematician every year, are named after Stefan Banach. His name is associated with a number of mathematical concepts and theorems, in particular the concept of Banach spaces, the Hahn-Banach theorem and the Banach fixed-point theorem (to which the images on the collector coins are linked). These concepts and theorems are presently not only known to professional mathematicians, but also to students of mathematics in higher years of study all over the world.

Banach was born in Kraków. As an infant he was given away by his father (known by the name of Greczek) to be raised by an owner of several launderettes in Kraków. Banach's father offered the lady a certain amount of money for rising the boy and provided for his education until he became full of age. Banach did not know his mother. Although it is now known, almost for sure, that her name was Katarzyna Banach.

In 1910 Banach graduated from secondary school and enrolled in studies at the Technical University of Lwów. Before the outbreak of WWI he passed all examinations included in the first two years of the study programme and his formal education came to an end. In fact, Banach was largely a self-taught mathematician, who acquired his knowledge mainly from reading (he knew French quite well). Because he was left-handed, he was not conscripted in the army and spent the war years in Kraków.

In 1916 Hugo Steinhaus, later a professor at the Jan Kazimierz University of Lwów, while walking in the Planty park in Kraków overheard two young men discussing the Lebesgue integral, which was then a relatively new concept, not taught at universities. They were Stefan Banach and Otto Nikodym. The latter was a young teacher of mathematics, who later became a world famous mathematician (the Radon-Nikodym theorem is among the fundamental theorems in the integration theory). Steinhaus decided to invite them to a private seminar during which he presented to them a problem he was trying to solve. He was amazed when Banach brought him a solution to the problem a few days later. It was then that Banach and Steinhaus wrote their first joint publication (though it was not the famous Banach-Steinhaus theorem – one of the fundamental ones in functional analysis).

After WWI, thanks to Steinhaus, Banach could achieve his dream. In 1920 he became an assistant in the Department under Professor Łomnicki at the Technical University of Lwów. In the same year he gained a doctorate, and then progressed quickly in his career. In 1922 Banach habilitated and became an associate professor at the Jan Kazimierz University of Lwów, and a full professor in 1927. Soon he attracted a team of outstanding mathematicians, among them, Stanisław Mazur, Władysław Orlicz, Julian Schauder, Stanisław Ulam, Marek Kac. Their work focused on functional analysis whose fundaments were mostly developed in Lwów. At that time functional analysis, which is still widely studied, was rather a new branch of mathematics. In 1929 Banach and Steinhaus founded "Studia Mathematica" – the world's second specialist journal of mathematics devoted to functional analysis and probability theory. (While most such periodicals were published abroad after World War II, the first and the third journals of mathematics were published in Warsaw). In 1932 the famous series "Monografie Matematycze" ("Mathematics Monographs") was founded. The first volume in the series "Théorie des Opérations Linéaires" written by Banach was the first monograph on functional analysis studied worldwide.

Banach and his colleagues used to meet at the Szkocka Café almost every day. It was the place where they discussed mathematical issues over a cup of coffee or a glass of beer and where they kept the famous Scottish Book, in which they wrote down mathematical problems of interest and discovered solutions. Some solutions were awarded with prizes like a few half-pints of beer, a bottle of wine. But there was also a live goose to be awarded by professor Mazur for solving a fundamental problem concerning the Banach spaces theory. The promised live goose was presented to young Swedish mathematician Per Enflo only in 1972.

The University of Lwów did not sustain its activity when the city of Lwów fell under the occupation of the Soviet Union. It closed down,

FACE VALUE 200 ZŁ

metal **Au 900/1000** ■ finish **proof** ■ diameter **27.00 mm** weight **15.50 g** ■ mintage (volume) **4,000 pcs**

OBVERSE: In the centre, an image of the Eagle established as the state emblem of the Republic of Poland, against the background of isolated planes being the outline of the territory of Poland. Below the Eagle, on the left, obliquely, the notation of the year of issue: 2012. At the bottom, diagonally, in an isolated area, a formula appearing in the Banach fixed-point theorem. Underneath, diagonally, an inscription: 200 ZŁ. At the top, a semicircular inscription: RZECZPOSPOLITA POLSKA (Republic of Poland). Under the Eagle, on the right, the Mint's mark: M/W.

REVERSE: On the right, against the background of a geometric pattern, a stylised image of a bust of Stefan Banach. Below it, on the right, obliquely, against the background of an isolated area, a mathematical formula illustrating the thesis of the Banach fixed-point theorem. On the left, diagonally, an inscription: STEFAN/BANACH. Below it, an inscription: 1892-1945.

Coin designer: **ROBERT KOTOWICZ**

FACE VALUE 10 ZŁ

metal **Ag 925/1000** ■ finish **proof** ■ diameter **32.00 mm** weight **14.14 g** ■ mintage (volume) **45,000 pcs**

OBVERSE: In the centre, a stylised image of a cuboid with a mathematical formula applied in the Hahna-Banach theorem placed on the cuboid faces. Underneath, an inscription: 10 ZŁ. Above it, on the right, an image of the Eagle established as the state emblem of the Republic of Poland. On the right of the Eagle, diagonally, the notation of the year of issue: 2012. At the top, a semicircular inscription: RZECZPOSPOLITA POLSKA (Republic of Poland). Under the Eagle, on the right, the Mint's mark: M/W.

REVERSE: In the centre, against a background of points forming circles, a stylised image of a bust of Stefan Banach. On the left, at the top, an inscription: STEFAN/BANACH. Below it, an inscription: 1892-1945. At the bottom, an inequality illustrating a connection between linear operators in Banach spaces.

Coin designer: **ROBERT KOTOWICZ**

FACE VALUE 2 ZŁ

metal **CuAl5Zn5Sn1 alloy** ■ finish **standard** ■ diameter **27.00 mm** weight **8.15 g** ■ mintage (volume) **800,000 pcs**

OBVERSE: An image of the Eagle established as the state emblem of the Republic of Poland. On the sides of the Eagle, the notation of the year of issue: 20-12. Under the Eagle, inscription: ZŁ 2 ZŁ. Along the rim, inscription: RZECZPOSPOLITA POLSKA (Republic of Poland), preceded and followed by six pearls. The Mint's mark: M/W, under the Eagle, on the right hand side.

REVERSE: In the centre, a stylised bust of Stefan Banach. On the left, a graph of linear operator. Below, an inequality characterising a condition concerning linear operators in Banach spaces. Underneath, an inscription: STEFAN/BANACH. At the bottom, an inscription: 1892-1945.

ON THE EDGE: The inscription: NBP, repeated eight times, every second one inverted by 180 degrees, separated by stars.

Obverse designer: **EWA TYC-KARPIŃSKA**
Reverse designer: **ROBERT KOTOWICZ**