

# Local Scientists Deliver Big Discoveries in 2012

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Antartica is a prime spot for research expeditions, such as the one that led to the probe of a subglacial lake. **Yevgeny Stetsko**

2012 was a busy and successful year for Russian scientists. They went on the hunt for long-hidden genomes, mysterious particles and subglacial lakes, and in their downtime deorbited multimillion-dollar satellites. The year wrapped up with the annual nationwide science festival, which aims to make scientific research more accessible to ordinary Russians.

The following list shows the most significant events in science in 2012 involving Russian scientists working either in national or international teams.

## **Denisovan DNA fully decoded**

A girl who lived in a Siberian cave more than 50,000 years ago might have craved attention like any typical teenager. Thanks to an international team of scientists, she is getting plenty

of fame now. A tiny fossil of the girl's finger was discovered in 2008 in the Denisova cave, in the Altai Mountains of southern Siberia. Following the discovery, a group of Russian archeologists and German paleogeneticists worked on decoding the Denisovan genome. They declared their mission a success on Feb. 7 and appeared struck by how precise their findings were. For example, they learned that the girl was a brunette and had brown eyes and skin. Denisovans, together with Neanderthals, are considered the closest extinct relatives of homo sapiens.

### **Higgs boson detected at CERN**

Nearly half a century ago, British professor Peter Higgs proposed a concept of basic particles, now known as Higgs bosons, through which all matter attains mass. Last summer, researchers finally spotted the elusive particle, making their feat the "breakthrough of the year 2012," an annual award given by Science magazine for the most significant development in scientific research. About 3,000 researchers worked on the Higgs project in the European Organization for Nuclear Research, also known as CERN, near Geneva. While Russia is not a member of CERN, more than 100 Russian scientists and doctoral students worked on the Higgs project. Following their triumph, in December, Science Minister Dmitry Livanov applied to CERN for associate membership for Russia.

### **Wonders of Lake Vostok**

A Russian scientific team drilled down through solid ice to a depth of 3,768 meters and reached the subglacial Lake Vostok in Antarctica in February, making them the first to probe a subglacial lake. Lake Vostok was isolated from Earth's atmosphere and biosphere for 14 million years, so scientists first developed new technologies to ensure that the lake stays free of outside influences. Analysis of the water, now in progress at the St. Petersburg Nuclear Physics Institute, will answer the question of whether it is possible to find life on icy planets and moons like Europa.

### **Intentional crash of Express-AM4 satellite**

Russian engineers intentionally crashed the Express-AM4 satellite into the Pacific Ocean on Mar. 25 due to an anomaly during its launch in 2011. Russian Satellite Communications Co. intended to use it for communication coverage over the country for 15 years, but when the satellite was launched, it wound up in a useless low orbit. The startup company Polar Broadband Systems tried to purchase the satellite to provide broadband coverage to researchers in Antarctica, and company leaders reportedly sent letters to Russian officials, but their efforts were unsuccessful. Express-AM4 was the most powerful satellite built in Europe, and now that the Russian company has collected its insurance payout of \$270 million, the launch of a similar satellite, Express-AM4R, is planned for this year.

### **Russia will not participate in Kyoto-2**

Russia took part in the heated discussions in Doha, Qatar, on the fate of the Kyoto Protocol. Together with the United States, Canada, Japan and India, the Russian delegates decided not to take on obligations under the second commitment period of the protocol. As a result, the protocol will now cover only 15 percent of the world's greenhouse-gas emissions.

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