'Blue Dot' – Alexander Gerst's mission to space

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The final exam in Russia has been passed, four and a half years of astronaut training across the globe are complete – and now, less than three weeks remain until the astronaut Alexander Gerst loses the ground under his feet for six months. The 38-year-old will set off for the International Space Station (ISS) on board a Soyuz spacecraft at 21:56 CEST on 28 May 2014. Six hours after launching from the Baikonur Cosmodrome in Kazakhstan, the spacecraft carrying Gerst and his colleagues, the US astronaut Reid Wiseman and Russian cosmonaut Maxim Suraev, will dock with the space research laboratory. "The closer I get to the launch, the more relaxed I feel," says the astronaut readying himself for his first space flight.

It all began in May 2009, when the European Space Agency (ESA) welcomed the volcanic researcher into its astronaut corps, selecting him from over 8400 applicants. Since then, Alexander Gerst has completed a marathon training course across several continents: "I travelled to the next training location pretty much every three weeks." Simulated landings for his return to Earth; underwater training for spacewalks outside the ISS; Russian language courses or rides on the centrifuge exposing the astronaut to brief bursts of eightfold gravity – a large team of experts from the German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt; DLR), ESA, NASA, the Japanese space agency, JAXA, and the Russian space agency, ROSCOSMOS, prepared Gerst to meet the challenges awaiting him on board the ISS.

Final preparations before launch

Over the course of the last six months, the astronaut has focused on acquiring the necessary skills to conduct a variety of experiments in a microgravity environment as the extended arm of ground-based scientists. But now the commutes between Houston, Moscow, Tokyo and Cologne are drawing to a close, and Gerst will be placed in quarantine at the Baikonur Cosmodrome, where contact will be restricted to a small group of support staff. Back in November 2013, the astronaut experienced almost exactly how his launch will unfold. At that time, he took his place as a reserve, a member of the backup crew, next to the launcher scheduled to take a group of astronauts to the Space Station. "You're in the thick of things right to the very end. You help the crew get into their spacesuits. You stand right next to the launcher as they're climbing in," says Gerst, looking back. "And that's the moment when you realise – just six months from now, you'll be on board this thing." Even then, he says, his most fervent wish was to get in and fly off, even if it meant sitting on 300 tons of fuel and being propelled into space by 26 million horsepower.

Gerst will live and work on board the ISS until 10 November 2014 – 166 days in total. The geophysicist's mission has been given the name 'Blue Dot' – inspired by a photo from the Voyager orbiter, showing Earth, in the words of the US astronomer Carl Sagan, as nothing more than a "pale blue dot". "From space, Earth is a small rocky sphere, enclosed in a fairly thin atmosphere – and that's all that protects people from cosmic radiation, everything that enables our lives. And we are treating it recklessly," says Gerst.

Experiments ranging from material physics to biology

Over the course of the mission, Gerst will conduct roughly 100 experiments covering a huge variety of disciplines, ranging from material physics and space medicine to biology. Twenty-five of these experiments will be conducted under the auspices of German project scientists or with some involvement by German industry. Gerst perceives the installation and commissioning of the electromagnetic levitator, a furnace scheduled to arrive at the Space Station on board the European transporter ATV-5 in July, as one of the real highlights. The German Space

Operations Center at DLR in Oberpfaffenhoffen will coordinate his work on board the European research laboratory Columbus, while MUSC (Microgravity User Support Center), a DLR institution in Cologne, will provide support within a European framework.

"What I'm looking forward to the most is the moment when I will gaze back at Earth," says Gerst. This will barely be possible in the tiny Soyuz capsule, in which the three astronauts will be cramped together at the end of May. "You get the first really good view once you've floated into the Space Station, greeted your colleagues and look back down to Earth from the Cupola."

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Training in Star City, near Moscow

Alexander Gerst underwent four and a half years of training for the Blue Dot mission, completing underwater protocols in Star City near Moscow and in other places. This training helped prepare him for spacewalks outside the International Space Station (ISS). The Blue Dot mission is scheduled to commence on 28 May 2014 with a launch from the Baikonur Cosmodrome.

Credit: Gagarin Cosmonaut Training Center (GCTC).

The Blue Dot mission in space – Alexander Gerst

The European Space Agency selected Alexander Gerst for astronaut training in 2009. He will set off for space on board a Soyuz spacecraft on 28 May 2014, becoming the third German to live in the International Space Station (ISS).

Credit: NASA.

Expedition 40/41

The German astronaut Alexander Gerst (left) will depart for six months on board the International Space Station (ISS) on 28 May 2014, together with the Russian cosmonaut Maxim Suraev (centre) and the American astronaut Reid Wiseman (right).

Credit: Gagarin Cosmonaut Training Center (GCTC).

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