



'Aktion 42' – weightless bubbles propelled by sound

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Student experiment selected for Alexander Gerst's mission

When German ESA astronaut Alexander Gerst flies to the International Space Station (ISS) in May 2014, his daily work will include conducting experiments. One of these experiments will involve analysing how soap bubbles behave in a microgravity environment and whether sound waves can set them in motion. Ideas for experiments were proposed by the participants of 'Aktion 42', a schools' competition held by the German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt; DLR), the European Space Agency (ESA) and the 'Jugend forscht' foundation for young researchers. The jury decided on an experiment that combines the ideas in the top three entries.

Over 50 students took part in the competition and submitted proposals. They were allowed to select items from a list of 42 'ingredients'. Quite independently, two teams of students came up with the idea of analysing the behaviour of soap bubbles in microgravity – Thomas Poller (17), Enrico Olzmann (17) and Max Neumerkel (17) from Sandberg Grammar School in Wilkau-Haßlau, Saxony, and Julius Schölkopf (15) and Lukas Bonfert (15) from Friedrich Schiller Grammar School in Marbach am Neckar. The idea proposed by the students is as follows – when in microgravity, soap bubbles should exhibit special properties. The gravitational force on Earth ensures that the water within the soap bubbles is dragged downward, reducing the thickness of the soapy film in the upper section. This is why soap bubbles burst quite quickly. But in a microgravity environment, the soap bubbles should remain stable for far longer. The students asked whether perhaps weightless soap bubbles might last forever? And what happens if you insert a paper clip or join two soap bubbles to form one? This is what Alexander Gerst will examine on the ISS.

Soap bubbles will also be used in a fairly unusual sound wave test. 16-year-old Katrin Geigenberger from Pater Rupert Mayer Grammar School in Pullach convinced the jury with her interesting proposal for an experiment featuring sound waves – is it possible to use concert pitch A or other notes to set soap bubbles in motion? Perhaps suspended droplets of water, too? Alexander Gerst will find out.

Preparing for the mission

"The children came up with some fantastic ideas," says Project Manager Matthias Sperl from the DLR Institute of Materials Physics in Space. "These questions have never been analysed in this combination, so the experiments are of significant scientific interest." Cooperating closely with the young scientists, DLR is now preparing the selected ideas for their implementation on board the ISS to ensure that they are 'space qualified'. The winners – together with four other teams who made it into the final cut – will be invited to a launch event in May 2014 to experience live what it is like when Alexander Gerst takes off to the ISS, and will have the opportunity to meet with the ESA astronaut for a personal interview upon his return to Earth. In addition, DLR will send all of the competing school teams a large aerospace surprise package.

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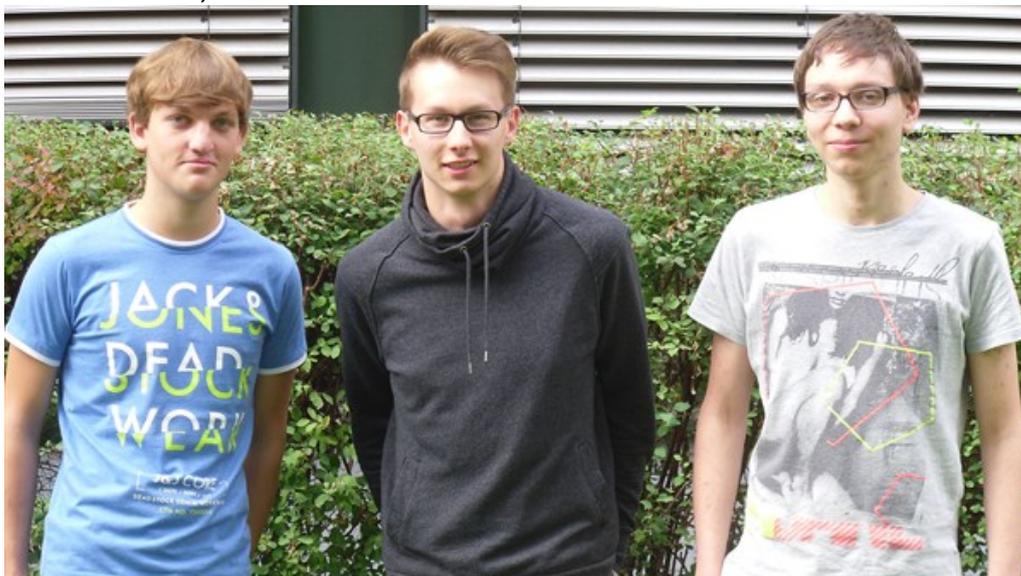
Soap bubbles for the ISS



How do soap bubbles behave in microgravity? And can they be propelled with sound waves? Ideas for experiments were proposed by the participants of 'Aktion 42', a schools' competition held by the German Aerospace Center (DLR), the European Space Agency (ESA) and the 'Jugend forscht' foundation for young researchers. When German ESA astronaut Alexander Gerst flies to the International Space Station (ISS) in May 2014, he will try to answer these questions.

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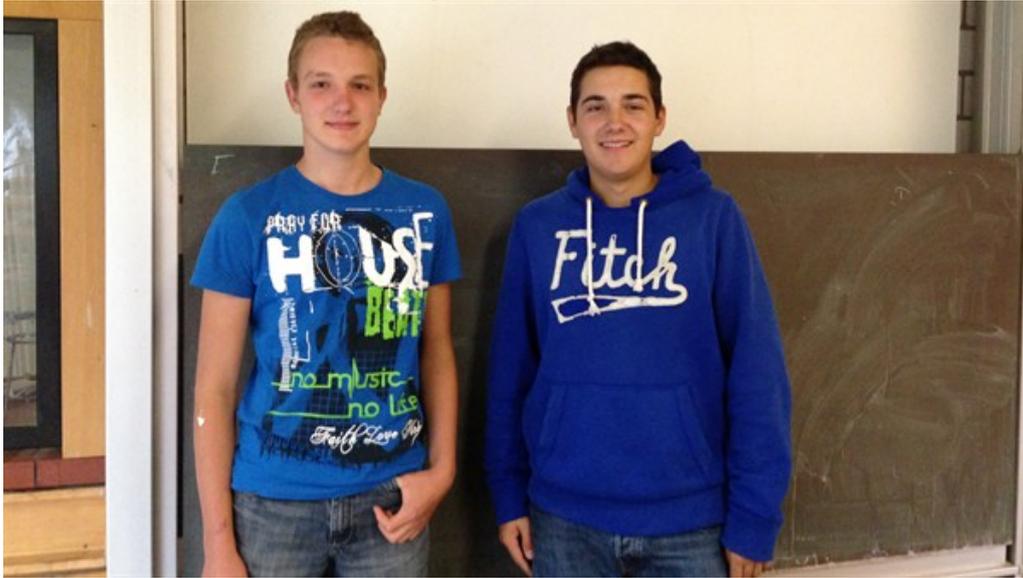
Max Neumerkel, Enrico Olzmann and Thomas Poller



One of the winning teams of Aktion 42. From left to right, Max Neumerkel, Enrico Olzmann and Thomas Poller, from Sandberg Grammar School in Wilkau-Haßlau, Saxony.

Credit: personal.

Lukas Bonfert and Julius Schölkopf



One of the winning teams of Aktion 42. Lukas Bonfert and Julius Schölkopf from Friedrich Schiller Grammar School in Marbach am Neckar.

Credit: personal.

Katrin Geigenberger



16-year-old Katrin Geigenberger from Pater Rupert Mayer Grammar School in Pullach convinced the jury with her interesting proposal for an experiment featuring sound waves.

Credit: personal.

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