#### **Press release**

**Plastic and space travel**

**Plastic in space**

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| **Space, the final frontier… and impossible to fathom without plastic, say experts. As controversial as the material is discussed on Earth, it is indispensable for journeys into the universe - whether for the meals of astronauts or in the construction of satellites and rockets.**  Our relationship with plastic is ambivalent. We use plastic every day, but hardly appreciate it. Such as PET bottles: they are practical to use, but are usually seen as mere disposable products - and annoying when they turn up as waste. In order to recognize the true significance of something, it is often worth looking beyond the horizon - in the case of plastic, even to the stars. The reason: “Without plastic, nothing works in space travel,” says Alexander Ihle, Structural Engineer at the European Space Agency (ESA) and responsible for Earth observation missions.  **How plastic is conquering space**  It may sound unusual at first, but what already characterizes plastic packaging on earth is also being used by the space industry - it is increasingly relying on the characteristic combination of lightness and stability. This applies both to the construction of spaceships and to the meals of space travelers. Their food is freeze-dried and dehydrated in plastic bags with a straw attached.  And just like here on Earth, the plastic packaging provides protection and preservation for a wide range of food and drinks in space. “You only have to look at what the first astronauts had at their disposal and what they now get in terms of food on the ISS space station. Neil Armstrong would probably never have dreamed that such a range would be possible. Plastic plays a very important role here,” says Hendrik Weihs, engineer and head of the Space Department at the German Aerospace Center (DLR).  **Stability and efficiency in space**  However, plastic packaging is not only indispensable for feeding astronauts; the material is also playing an increasingly important role in the construction of rockets. “It starts with adhesives,” explains ESA structural engineer Alexander Ihle, ”and continues with plastic films. These are needed in space systems as sun protection, for example.” This also applies to the construction of special elements, as Alexander Ihle explains: “We use fiber-reinforced plastics to manufacture components that are both lightweight and durable, as well as having a high temperature resistance.”  Nicole Thalhofer, Head of Space Travel at the German Aerospace Industries Association (BDLI), emphasizes: “The use of plastics and synthetic materials in space has significantly increased the efficiency of space missions.” She cites an example: “ArianeGroup is currently working on ICARUS, an innovative rocket upper stage made of carbon fiber reinforced plastic (CFRP).” She also points out other areas of application: “Plastics can be found not only in structural components, but also in purely functional components such as insulation and seals.”  **Future material for the cosmos and earth**  High-performance plastics, which are additionally equipped with thermal protection systems for the return from space, are therefore playing an increasingly important role in rocket construction alongside metal. And, of course, they are also a sign of sustainability. DLR department head Hendrik Weihs: “We are seeing that the classic rocket is slowly making its way towards a reusable space transportation system.” BDLI space specialist Nicole Thalhofer: “The developments in the field of plastics in space travel also have important implications for applications on Earth. In the case of CARUS, ArianeGroup is researching how to develop and build CFRP tanks for cryogenic liquids with temperatures as low as minus 250 degrees Celsius.” This would be relevant for the transportation and storage of hydrogen, for example.  **Recyclable spaceships from the 3D printer**  “In my department, we are currently looking at bio-based materials,” explains Hendrik Weihs from DLR and says: ”A lot is also possible with plastics. You always have to look at the overall scenario, whether for rockets or satellites.” Alexander Ihle adds: “The trend in space travel is clearly moving towards fiber-reinforced plastics. The material has numerous advantages and you can do a lot with it. And it can also be used in an environmentally friendly way. I think the example of the PET bottle is a good one here.” This is aimed at the recycling property. After all, the use of plastics in space travel is also characterized by sustainability and the circular economy. As PET bottles show - they are highly recyclable, even 100 percent in the bottle-to-bottle process.  It is possible that the recyclable and bio-based plastic rockets of the future will come entirely from 3D printers. Inflatable space habitats made from plastic fibers are already being tested today. Eventually, space habitats will also be built from recycled plastic bottles. Innovations in the field of plastic packaging could certainly serve as a source of inspiration here. We don't know whether the most famous Vulcan in film history would have said “Plastic is fantastic”, but his “fascinating” certainly rings a bell.  **Image material:**  **Image 1**    *CubeSat mini-satellite: The European Space Agency (ESA) uses electrically conductive plastic to 3D print the casings of small satellites with a side length of just 10 centimeters. The plastic is so robust that it can replace metal in some areas.*  (ESA-G. Porter, own image)  **Image 2**    *Eating and drinking in the stars: the astronauts' food is provided in special plastic packaging that protects it from space conditions, prevents crumbs from escaping and enables it to be prepared safely. (ESA/NASA - T. Pesquet, own image)*  **Image 3**    *Paving the way into space: The “Procomp” project of the Institute of Structures and Design at DLR aims to further develop structures made of carbon fiber-reinforced high-performance plastics for space travel. (DLR (CC BY-NC-ND 3.0), own image)* | **Contact**  Claudia Wörner  yes or no Media GmbH  Vor dem Lauch 4  70567 Stuttgart  Germany  [www.yes-or-no.de](http://www.yes-or-no.de)  Tel + 49 711 7585 8900  presse@yes-or-no.de  Characters: 5.398 |

**About "Plastic is fantastic"**

“Plastic is fantastic" is about the relationship between humans and one of the most elementary building blocks of civilization: plastic. The initiative aims to achieve the appreciation that this versatile material deserves through factual contributions.

Alpla, the Austrian specialist for plastic packaging, has launched the campaign "Plastic is fantastic*",* duetoitsfirmbeliefinthe potential of recyclablematerial. Alpla is now in its third generation of commitment to sustainable recycling solutions and is also a pioneer in the development of new bioplastics.

The new website ["Plastic is fantastic"](file:///\\192.168.178.113\yon\Projekte%20in%20Arbeit\Alpla\2861_1%20ALPLA%20pif%20Landingpage%20Umsetzung\Inhalte%20Landingpage\Beiträge\Ein%20Material%20in%20neuem%20Licht\3141_1%20Alpla%20pif%20Eierkarton%20Text%20final%20250303.docx) also shows what makes plastic so fantastic.