146th MSS-Seminar
Wednesday, March 2nd,
15:30 hrs, H3,
Egerlandstr. 3, Erlangen.

ZARM's New Next-Generation Drop Tower System

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With a height of 146 m, the Bremen Drop Tower is the predominant facility of ZARM, the Center of Applied Space Technology and Microgravity, and also the only drop tower of this kind in Europe. ZARM's ground-based laboratory offers the opportunity for daily short-term experiments under conditions of high-quality weightlessness at a level of 10(-6) g. Scientists may choose up to three times a day between a single drop experiment with 4.74 s in simple free fall and an experiment in ZARM's worldwide unique catapult system with 9.3 s in microgravity. Since the start of operation of the drop tower facility in 1990, over 9400 drops or catapult launches of more than 300 different experiment types from various research fields have been accomplished so far. In addition, more and more technology tests have been performed under microgravity conditions at the Bremen Drop Tower, in order to prepare single space instruments or appropriate space missions in advance.
The GraviTower Bremen Pro (GTB Pro) represents ZARM's new next-generation drop tower system, which makes use of a rail-guided rope drive being able to perform over 12 short-term microgravity experiments per hour. Its technology is based on a commercial hydraulic winch system with more than 4000 hp of engine power that moves a rail-guided drag shield in a 16 m high tower, upwards and downwards. With its Release-Caging-Mechanism (RCM), the actively driven GTB Pro located in the integration hall of the Bremen Drop Tower is capable to control heavy payloads in a very smooth and precise manner. Furthermore, its user-friendly software interface brings microgravity experimenting on a laboratory level. Due to the fact that the same standard capsule can be used, high synergy effects are given for ZARM's drop tower users. It means a simple change in all operation modes, between drop, catapult, and GTB Pro.