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HYPER 1: DEVELOPMENT OF A HYBRID PROPULSION SYSTEM FOR EXPERIMENTAL  
ROCKETS**Abstract**

Hyper 1 is the first engine of the Hyper series (**H**ybrid **P**ropulsion for **E**xperimental **R**ockets), designed for experimental rocket applications. The student group *Wissenschaftliche Arbeitsgemeinschaft für Raketentechnik und Raumfahrt* (WARR) of the *Technische Universität München* (TUM) continues its efforts in building rocket engines, which has begun with the development of the first German Hybrid Rocket *Barbarella*. We strive to design this engine from scratch on our own. Therefore a smaller engine, HY-500T, and a test bench have already been built to gather relevant data concerning combustion. Hyper 1 runs on HTPB/N<sub>2</sub>O and creates about 1000 N thrust during a burning period of 10 s. Simulations indicate a possible flight altitude of about 6 000 m with a maximum velocity of about Mach 1.0. The engine is the most powerful one ever built by the WARR and is a challenge for us as a student group.