TIM - APico-Satellite-Formation for Earth Observation

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TIM - Telematics International Mission .

ZfT and University Würzburg coordinate the project TIM of the partner regions Bavaria, Georgia, Upper Austria, Quebec, São Paulo, Shandong, and Capetown to build a sensor network of pico-satellites for Earth observation, where the partners contribute satellites or satellite components.

Also the new Bavarian Primeminister Dr. Söder was informed 2018 about the TIM project

Pico-Satellite-Formation for Earth Observation

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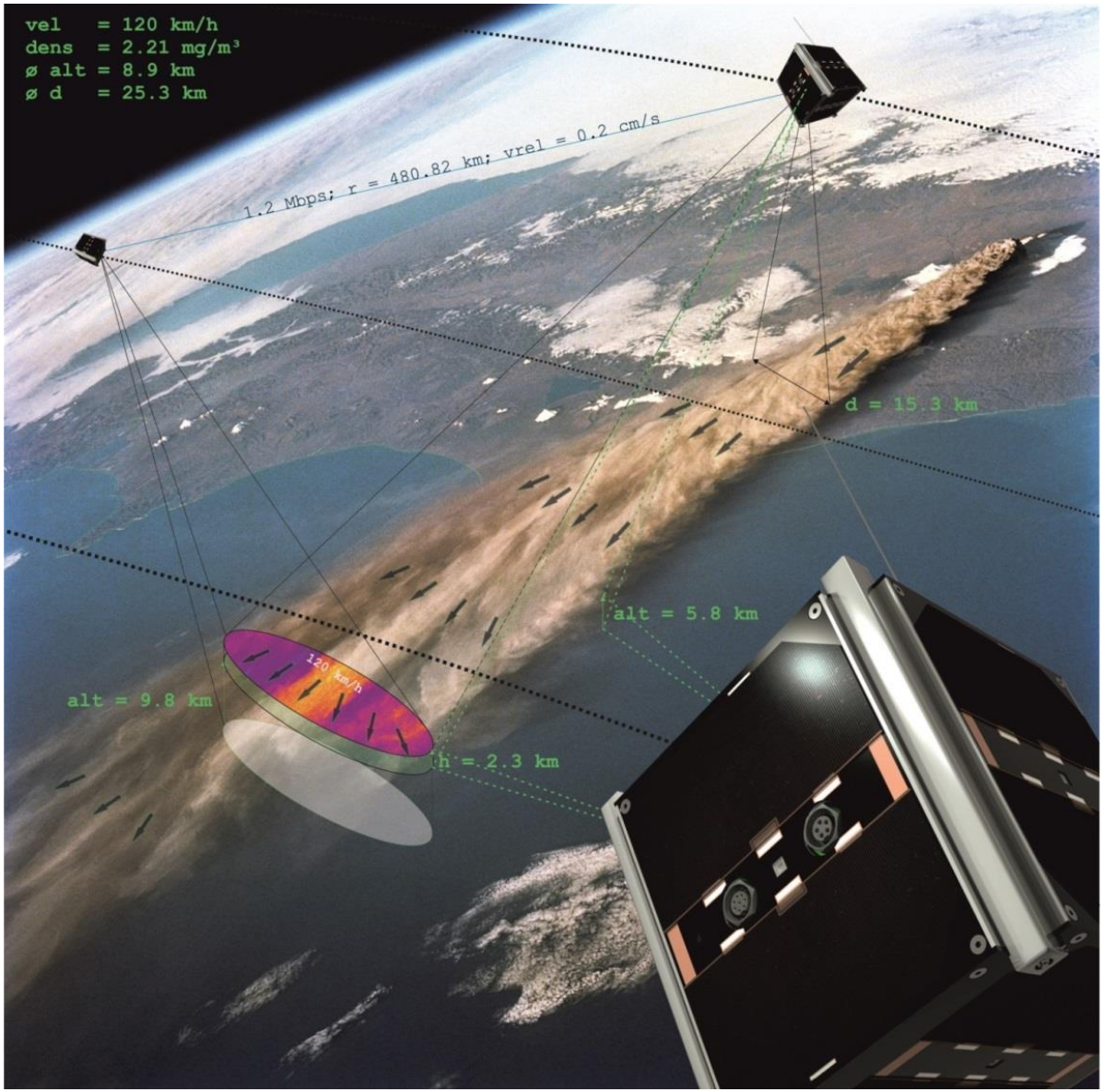

TIM - *T*elematics *I*nternational *M*ission

potential application fields:

- photogrammetric volcano ash cloud observation,
- cloud height measurements,
- Monitoring of Lightnings,
- fires and floods,
- soil moisture monitoring,
- maritime applications (illegal fishing, coast monitoring),
- environmental warning

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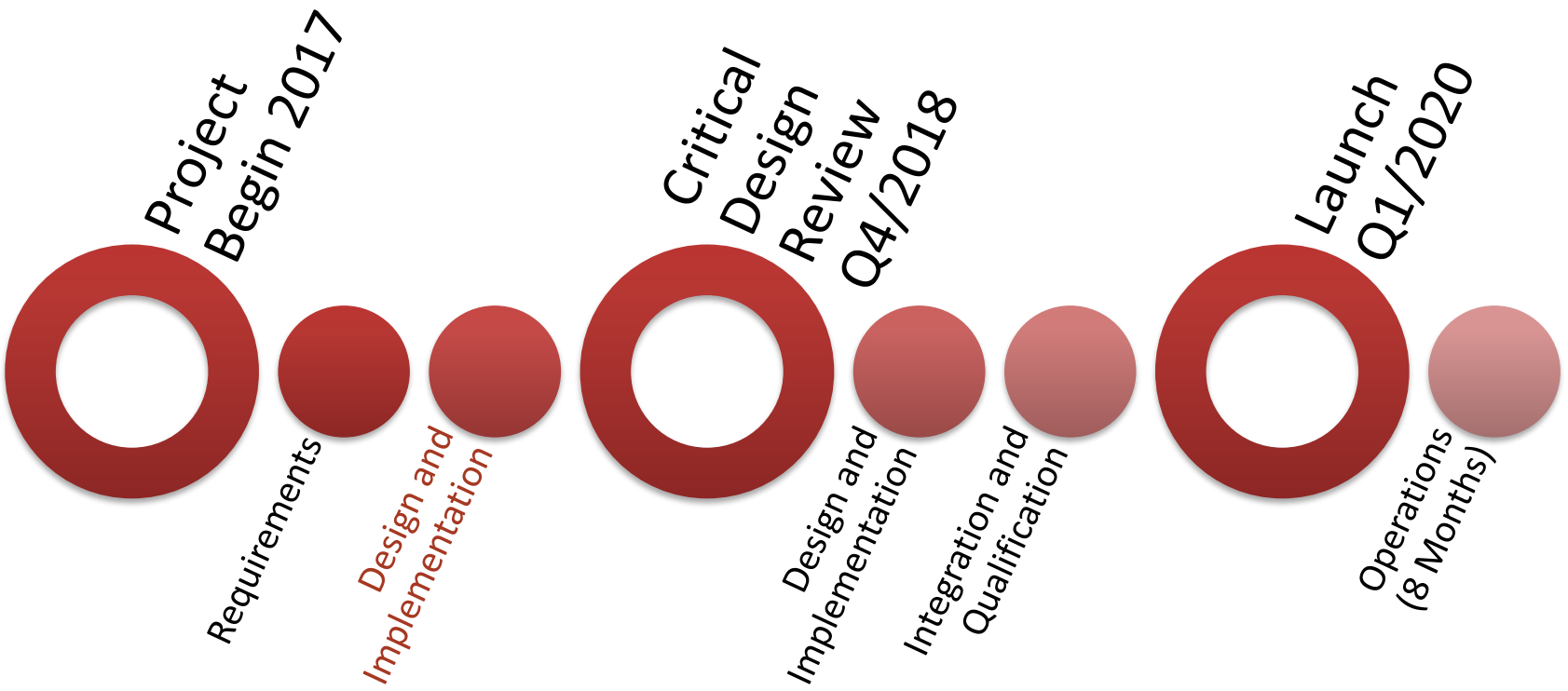
Project Status

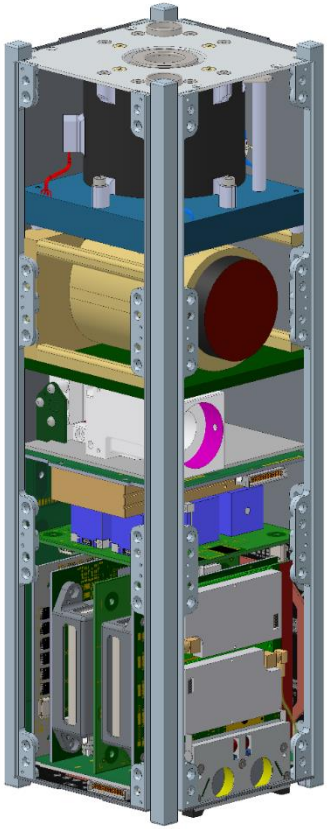
Schedule and Milestones



Concept Design

Subsystems

Propulsion



Camera

OSIRIS

S Band Downlink

Attitude Control ADCS

Onboard Computer OBC

GPC General Purpose Controller

Electric Power System EPS#1

UHF COMM Communication System

Electric Power System EPS#2

Simulation of Dynamic Observation Geometries for Camera Testing

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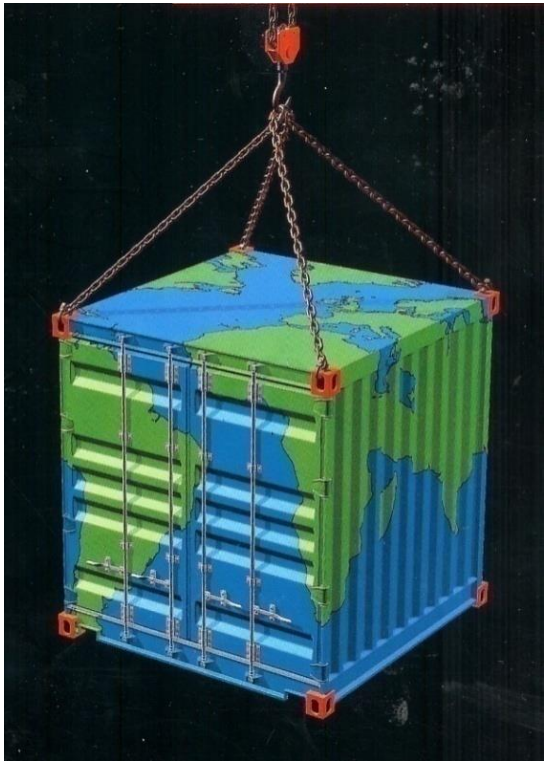
The paradigm shift from traditional large spacecraft with multiple payloads towards cooperating, distributed, networked small satellite systems offers interesting potential for applications, for research, and for international cooperation.

Technology achievements in the field of very small satellites (even at 1 kg level):

- modular, flexible design with standardized interfaces via backplane
- suitable attitude determination and control capabilities
- robust miniaturized on-board data handling system
- orbit control capabilities by electric propulsion

Networked satellite systems offer efficient approaches:

- high spatial and temporal resolution of observation data
- cooperative solution of complex tasks by parallelization
- higher fault tolerance and robustness of the overall system
- scalability (according to application needs further satellites can be added)



Formations offer excellent opportunities for cooperation in international partnership on innovative science !

Conclusions