ICARUS

INVITATION TO JOIN A GLOBAL SMALL-OBJECT (ANIMAL) OBSERVATION SYSTEM

MAX-PLANCK-GESELLSCHAFT

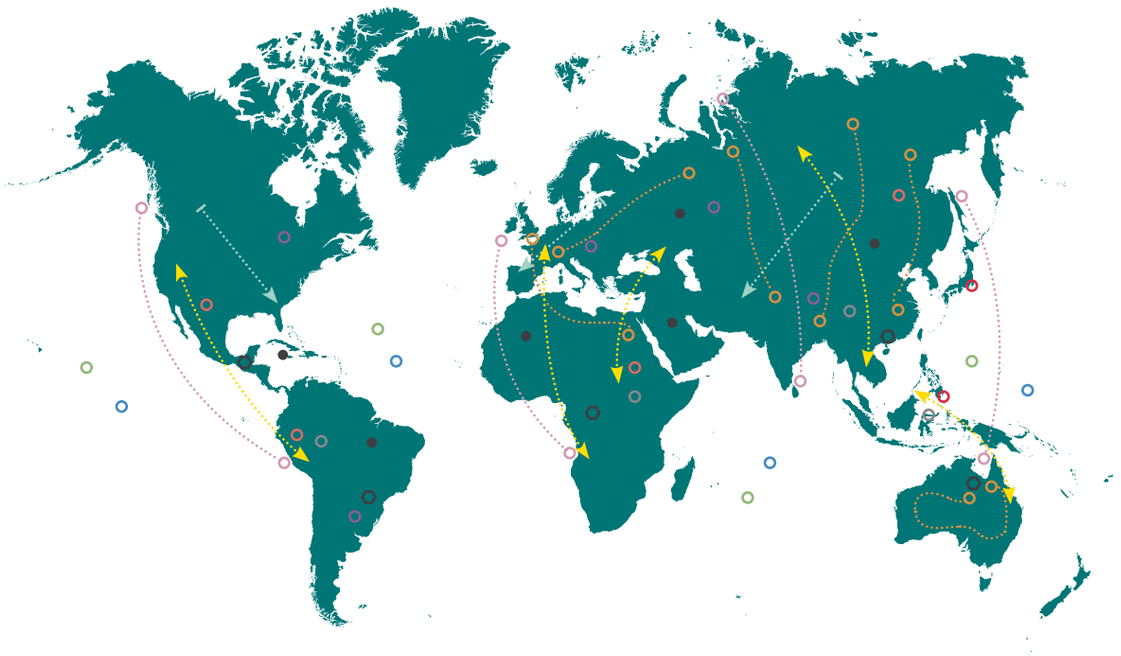
WHAT IS ICARUS?

ICARUS, short for „International Cooperation for Animal Research Using Space", is a global collaboration of animal scientists to establish a satellite based infrastructure for earth observation of small objects such as migratory birds, bats or sea turtles.

WHY ICARUS?

ICARUS will provide a seeing-eye dog for humankind. We will use the evolved senses of animals for remote sensing. Examples are:

- Disaster forecast via animals
- Health and Disease (Avian Influenza, Foot and Mouth disease, Ebola)
- Ecosystem Services (Pollination, pest control, seed dispersal)
- Conservation (Dispersal in tigers & conservation of endangered species)
- Global change (Habitat shifts, desertification, glacial melts)
- Discovery of unknown migrations



PROJECTS

- Seabirds
- Shorebirds
- Seaturtles
- Bats
- Carnivores
- Waterbirds
- Thrushes
- Disaster
- Navigation
- Cuckoos
- Unknown migrations
- Global Carbon Balance

Head of project

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Executive board

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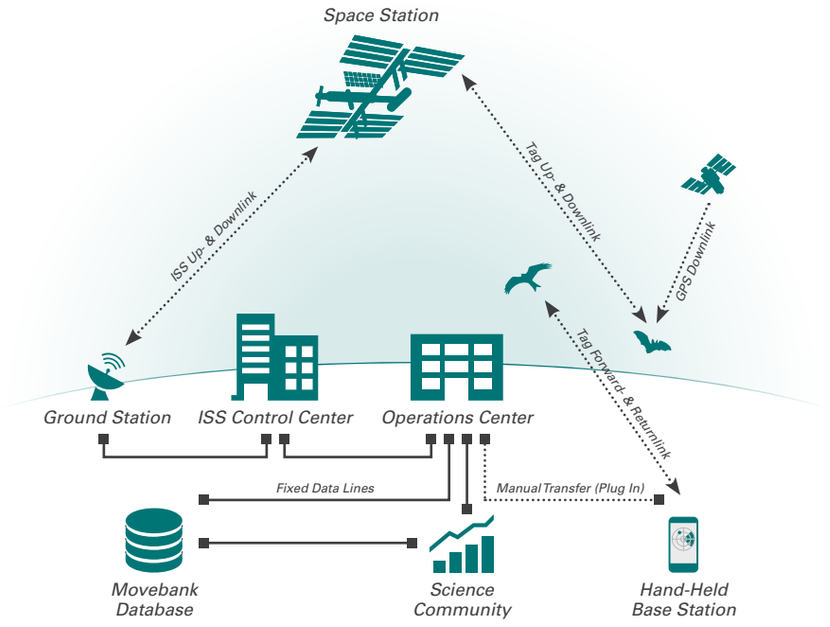
Partners

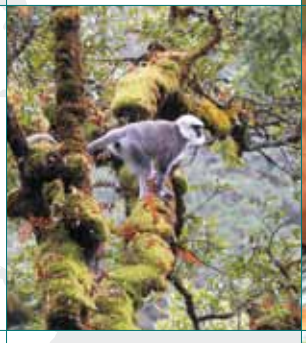
HOW DOES ICARUS WORK?

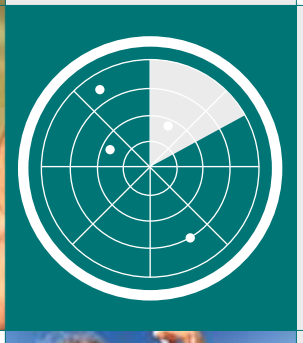
- Data collection in black box logger on individual small animal including GPS, 3D acceleration sensors and other sensors
- Autonomous energy supply (solar cell in combination with rechargeable batteries)
- On-tag processing, data reduction and selection of relevant data
- Transmission of small data packages to LEO satellite
- CDMA coding of signal and data
- Decoding of signal on board of satellite, downlink to ground station
- Data distribution and storage via movebank *(www.movebank.org)*



INVITATION TOWARDS A GLOBAL SPACE PARTNERSHIP

- ICARUS will fly experimentally on the ISS
- Launch is planned for end of 2015
- Space nations as major partners are welcome to join ICARUS
- Major partners will:
  - Fly ICARUS payloads on their LEO satellite
  - Receive technology transfer within the ICARUS team
  - Be able to build their own ground segment, tags and do own research and observations
- Share joint data with all ICARUS partners
- Win-win situation: read out data for all other major partners thus receive better global coverage
- Partners are also welcome to share newest DLR funded satellite bus technologies





PLEASE JOIN US

WE NEED YOUR HELP AND EXPERTISE TO MAXIMIZE THE BENEFITS OF THIS GLOBAL SMALL-OBJECT (ANIMAL) OBSERVATION SYSTEM.

→ *www.icarusinitiative.org*

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