

tBEARR

Tardigrade Bio-ExplorAtion Reproduction Research Satellite



3U CubeSat Studying the Effects of UV & Space Radiation on Tardigrade Reproduction

Abstract

- CubeSats are becoming more popular for orbital missions as the cost of sending satellites into space decreases
- CubeSats are smaller than traditional satellites but still capable of important science-based missions at a lower cost
- Tardigrades are known for their ability to survive in extreme environments and with little oxygen, food, and water
- tBEARR aims to study the effects UV light and space radiation has on tardigrade reproduction cycles
- Teams will conduct on-ground lab research on the tardigrades to acquire data that can be compared to that of which is gathered in orbit
- Critical life support systems will be developed to maintain tardigrade viability while orbital experiments are being conducted

Our Team

- 10 Engineering Students
 - Experience assists in future classes and comprehension of satellite mission logistics
- 8 Aerospace Physiology Students
 - Hands on laboratory and research paper experience that can prepare for graduate courses

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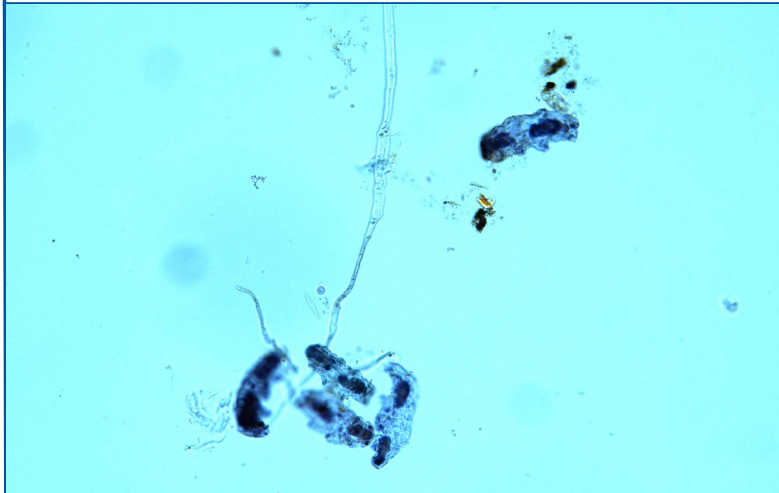
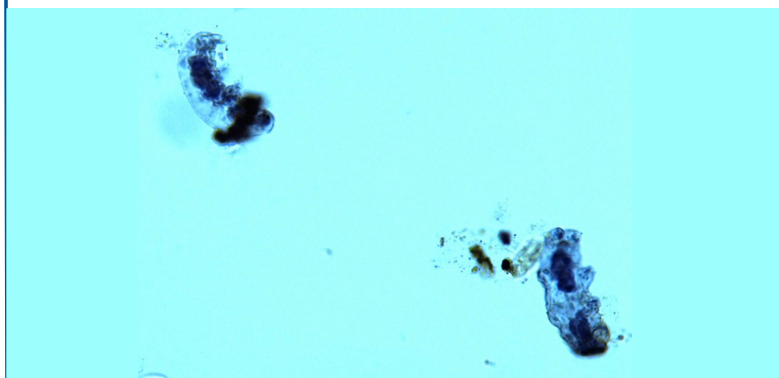


Fig. 1&2: *Hypsibius Exemplaris* species stained with fluorescent agent highlighting internal systems



Research

- tBEARR aims to conduct both on ground and in space research to study tardigrade genome resiliance to radiation
- Results from our research may offer insights on their ability to survive other harsh conditons including anoxia, microgravity, and extreme temperatures



Fig. 3: 40x magnification photo of a tardigrade taken by our team

Payload

- Team members will use data obtained from our research experiments to develop necessary life support systems
- Currently, members are working on payload structure and exposure door prototypes
- In future semesters, the team will begin 3D printing & manufacturing these prototypes for additional testing and validation