

Microrobots Inspired by Oceanic and Bacteria Organisms for Observations of Venus' Upper Atmosphere

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Figure 1. (a) Wind-powered rover concept for potential Venus mission¹, and (b)-(c) Flying Drone Concepts for Venus².

- One of NASA's goals is to send a mission to Venus to learn more about the history and evolution of Venus.
- Venus is known to have scorching temperatures and a thick atmosphere.
- **Current Work by NASA:**
 - NASA has been exploring a pure mechanical rover to explore the surface of Venus due to the hazardous conditions.
 - Black Swift Technologies – working with NASA to design a UAV for conducting upper atmosphere observations.

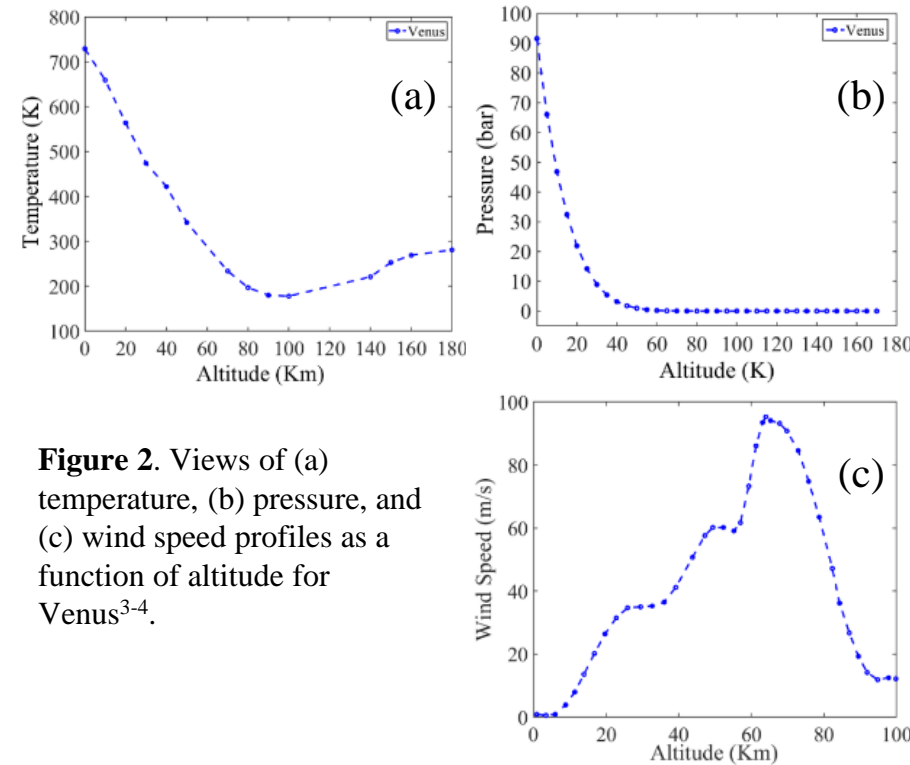
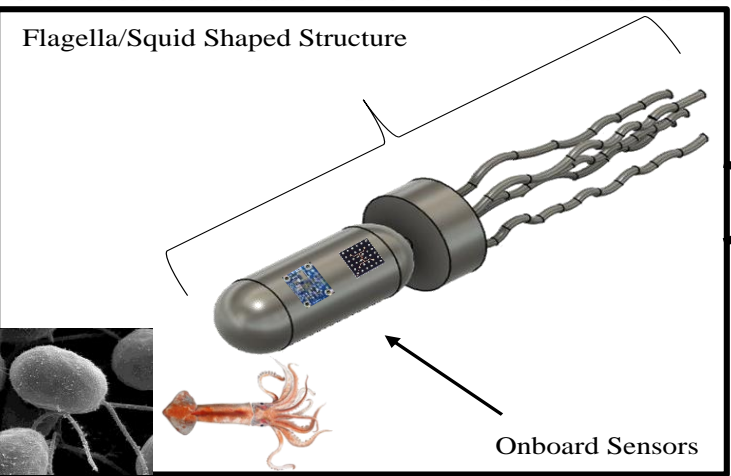


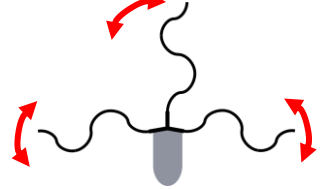
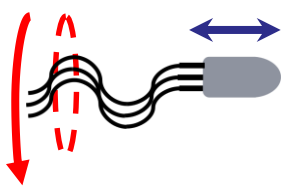
Figure 2. Views of (a) temperature, (b) pressure, and (c) wind speed profiles as a function of altitude for Venus³⁻⁴.

Bacteria Flagella as Micro-Robots for Venus Atmosphere Exploration

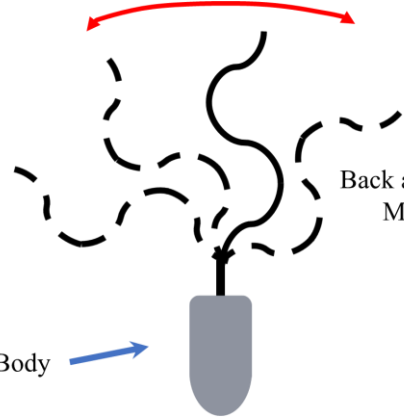
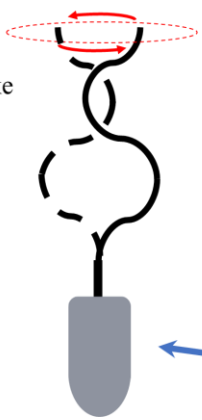


Bundled Flagellum

Tumble Flagellum

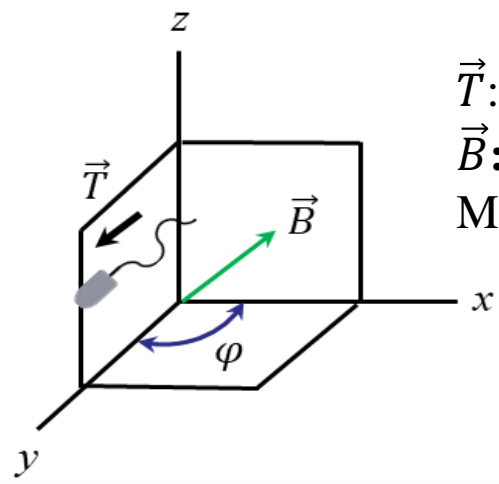


Propeller Like Motion



Back and Forth Motion

Body



\vec{T} : Trajectory Path
 \vec{B} : Rotational Magnetic Field Vector