



SPACE - Project Ideas

- Techniques for detecting “life” molecules
- Designing a Space Debris Removal System
- Robot for Space terrain Exploration using biomimicry.

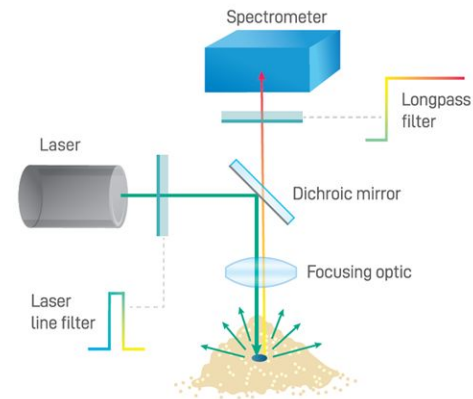


Techniques for detecting “life” molecules

- Using Chemistry and knowledge of spectroscopy to analyze data to detect deoxyribose, an essential sugar in DNA or the chlorophyll molecule

This involves investigating methods like Raman Spectroscopy

<https://pubs.acs.org/doi/10.1021/acs.jchemed.0c01028>



Designing a Space Debris Removal System

Space debris is a hazard and difficult to dislodge.

The most feasible strategy is to lower orbit enabling it to enter earth's dense atmosphere and burn out.

Here a working prototype using perhaps a water pool to simulate low gravity might be done.

Designing a scaled prototype to dislodge >10cm size debris

<https://www.sciencedirect.com/science/article/abs/pii/S027317708006820?via%3Dihub>

<https://fas.org/publication/how-do-you-clean-up-170-million-pieces-of-space-junk/>



Robot for Space terrain Exploration using biomimicry.

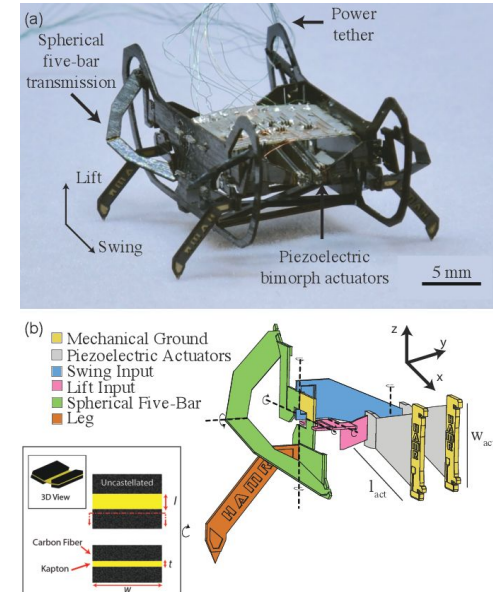
Cockroach inspired robots/robotic swarms o explore unknown and hostile terrain

The robot should be able explore caves and crevices, use minimum energy and be able to shield instruments and sensors as the cockroach shields its body with its chitin cover/exoskeleton

This project will involve biomechanics, adapting cockroach locomotion style etc.

<https://www.semanticscholar.org/reader/be31b693f95dbd3a12b4cb3c706c5f40eb4cb9c9>

<https://spectrum.ieee.org/dash-hexapedal-cockroach-inspired-robot>





SPACE - Suggested References

https://www.nrsc.gov.in/EO_Earth_Objective