

# ALEXANDER MICHAEL REAVES

✉ amr200@cam.ac.uk | 📧 alexander-reaves | ☎ +1 (480) 213 – 1323

## EDUCATION

---

<b>University of Cambridge</b> <i>Masters of Research in Future Propulsion and Power</i>	Cambridge, UK October 2021 – August 2022
<b>Yale-NUS College</b> <i>Bachelor of Science in Physical Sciences (Physics)</i>	Singapore August 2017 – May 2021
<b>University of Cambridge, Pembroke College</b> <i>Coursework in Mathematics and Theoretical Physics</i>	Cambridge, UK May 2019 – June 2020
<b>Phoenix Country Day School</b> <i>High School Diploma</i>	Arizona, USA August 2014 – June 2017
<b>Arizona State University</b> <i>Coursework in Computer Science</i>	Arizona, USA May – July 2016

## RESEARCH EXPERIENCE

---

- |  |  |
|--|--|
| <b>Yale-NUS Physical Sciences Major</b><br><i>Capstone Student</i> | Yale-NUS College & University of Cambridge<br>August 2020 – May 2021 |
|--|--|
- Conducted a yearlong research project modeling the interactions between granular flows and hydropower turbines.
  - Met weekly with supervisors from the University of Cambridge and Yale-NUS College to present relevant findings.
- |  |   |
|--|---|
| <b>NASA Ames Research Center</b><br><i>Summer Intern</i> | National Aeronautics and Space Administration<br>June – August 2020 |
|--|---|
- Used Creo Parametric to design 3D models of components for the International Space Station.
  - 3D printed and tested multiple iterations of a CO<sub>2</sub> sensor which could be manufactured in space.
- |   |  |
|---|--|
| <b>Yale-NUS Sciences Department</b><br><i>Summer Research Assistant</i> | Yale-NUS College<br>June – August 2019 |
|---|--|
- Awarded full funding from the JY Pillay Global-Asia Programme to work under Prof. Chelsea Sharon to research the feasibility of radio astronomy data collection in Singapore.
  - Designed and built a radio telescope which will be used to test the suitability of Singapore's RF environment for radio astronomy observations.
  - Programmed basic data-collection and signal processing interfaces for the telescope.
- |  |  |
|--|--|
| <b>Centre for Advanced 2D Materials</b><br><i>Research Assistant</i> | National University of Singapore<br>May 2018 – August 2019 |
|--|--|
- Awarded full funding from JY Pillay Global-Asia Programme to work under Prof. Shaffique Adam to research superconductivity in twisted bilayer graphene.
  - Created and ran simulations to determine the electronic band properties and lattice structure of superconductive twisted bilayer graphene.
  - Presented relevant papers and research findings in group meetings and weekly journal clubs.
  - Published results of research in *Solid State Communications*. To date, the paper has been cited over 50 times.

- Developed methodologies for optimizing wireless connections on embedded computer systems.
- Wrote wireless transmission code on an arduino in order to support a graduate student on his wireless pH sensor project.

## OTHER PROFESSIONAL EXPERIENCE

---

### Open Ventilator System Initiative (OVSI)

Engineer / Engineering Coordinator

University of Cambridge

March 2020 – June 2020

- Assisted in the design and creation of multiple versions of an affordable, hospital-quality, ventilator system that can be sustainably manufactured and maintained in low and middle-income countries.
- Managed information sharing and co-development between engineering groups in the United Kingdom, Kenya, Uganda, and Ethiopia.

### United Nations Office for Outer Space Affairs

Online Volunteer

United Nations

December 2018 – March 2019

- Researched various methodologies for wastewater recycling and their potential to be applied in order to help achieve UN Sustainable Development Goal 6: Sustainable Management of Water and Sanitation for All.
- Wrote articles for the UN's Space4Water portal which explain the potential applications of space technologies for water management to a non-technical audience.

## PUBLICATIONS AND PRESENTATIONS

---

### Singlet superconductivity enhanced by charge order in nested twisted bilayer graphene

**Fermi surfaces** Evan Laksono, Jia Ning Leaw, **Alexander Reaves**, Manraaj Singh, Xinyun Wang, Shaffique Adam, Xingyu Gu; Solid State Communications, Volume 282, Pages 38-44, October 2018

<https://doi.org/10.1016/j.ssc.2018.07.013>

### Wastewater recycling on the ISS and in Singapore

**Alexander Reaves**; United Nations Office of Outer Space Affairs, Space4Water, February 2019

<https://www.space4water.org/news/wastewater-recycling-iss-and-singapore>

### Magnetotransport properties in twisted bilayer graphene at magic angle

Evan Laksono, **Alexander Reaves**, Manraaj Singh, Xingyu Gu, Jia Ning Leaw, Nimisha Raghuvanshi, Shaffique Adam; American Physical Society, Abstract: S14.00010, March 2019

<http://meetings.aps.org/Meeting/MAR19/Session/S14.10>

## HONORS AND AWARDS

---

### President's Special Award for Pandemic Service

2020

- Award given to OVSI from the Royal Academy of Engineering for contributions to addressing the challenges of the COVID-19 pandemic.

### JY Pillay Global-Asia Programme Research Award

2018 & 2019

- Received full funding to construct a radio telescope to test the suitability of Singapore's RF environment for radio astronomy observations during summer 2019.
- Received full funding to research superconductivity in twisted bilayer graphene during summer 2018.

## TECHNICAL STRENGTHS

---

<b>Computer Languages</b>	C, C++, MATLAB, Python, R
<b>Software &amp; Tools</b>	Creo, LabVIEW, L <sup>A</sup> T <sub>E</sub> X, Mathematica, Microsoft Office

## EXTRA CURRICULAR

---

<b>Yale-NUS College Student Government (Director of Academics)</b>	May 2020 – May 2021
<b>Yale-NUS Science Society (President)</b>	January 2018 – May 2019
<b>Yale-NUS Sexual Assault Prevention and Education Taskforce</b>	January 2018 – May 2018

## REFERENCES

---

**James Taylor** | Assistant Professor, Department of Engineering | University of Cambridge  
1 JJ Thomson Ave, Cambridge, United Kingdom, CB3 0DY  
jvt24@cam.ac.uk | +44 7950-852578

**Sam Grimshaw** | Mitsubishi Heavy Industries Senior Research Fellow | University of Cambridge  
1 JJ Thomson Ave, Cambridge, United Kingdom, CB3 0DY  
sdg33@cam.ac.uk | ++44 1223 337 581

**Chelsea Electra Sharon** | Assistant Professor, Physical Sciences | Yale-NUS College  
01-101, 10 College Avenue West, Singapore, 138609  
chelsea.sharon@yale-nus.edu.sg | +65 6601-7558

**Zhuang Bilin** | Assistant Professor, Physical Sciences | Yale-NUS College  
01-101, 10 College Avenue West, Singapore, 138609  
zhuang.bilin@yale-nus.edu.sg | +65 6419-1275