

# ALEXANDER MICHAEL REAVES

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Aerospace Engineering Ph.D. student in the EPSRC CDT in Future Propulsion and Power at the University of Cambridge. 4+ years of scientific research experience. Strong technical expertise in turbomachinery, propulsor design, and physics-based modeling.

## EDUCATION

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<b>University of Cambridge</b> <i>Ph.D. in Future Propulsion and Power (Aerospace Engineering)</i>	Cambridge, UK October 2022 – Present
<b>University of Cambridge</b> <i>M.Res. in Future Propulsion and Power (Aerospace Engineering)</i>	Cambridge, UK October 2021 – August 2022
<b>Yale-NUS College</b> <i>B.S. with Honours in Physical Sciences (Physics)</i>	Singapore August 2017 – May 2021
<b>Phoenix Country Day School</b> <i>High School Diploma</i>	Arizona, USA August 2014 – June 2017

## RESEARCH EXPERIENCE

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<b>Yale-NUS Physical Sciences Major</b> <i>Capstone Student</i>	Yale-NUS College & University of Cambridge August 2020 – May 2021
<ul style="list-style-type: none"><li>• Conducted a yearlong research project modeling the interactions between granular flows and hydropower turbines.</li><li>• Met weekly with supervisors from the University of Cambridge and Yale-NUS College to present relevant findings.</li></ul>	
<b>NASA Ames Research Center</b> <i>Summer Intern</i>	National Aeronautics and Space Administration June – August 2020
<ul style="list-style-type: none"><li>• Designed 3D models of components for the International Space Station using <b>Creo Parametric</b>.</li><li>• 3D printed and tested over 20 iterations of a CO<sub>2</sub> sensor which could be manufactured in space.</li></ul>	
<b>Yale-NUS Sciences Department</b> <i>Research Assistant for Professor Chelsea Sharon</i>	Yale-NUS College June – August 2019
<ul style="list-style-type: none"><li>• Awarded funding of over SGD \$3,000 from the J.Y. Pillay Global-Asia Programme to research the feasibility of radio astronomy data collection in Singapore.</li><li>• Designed, constructed, and wrote code for a 1420 MHz horn radio telescope based off of the Bessie radio telescope design from Open Source Radio Telescopes.</li></ul>	
<b>Centre for Advanced 2D Materials</b> <i>Research Assistant</i>	National University of Singapore May 2018 – August 2019
<ul style="list-style-type: none"><li>• Awarded full funding of over SGD \$3,000 from J.Y. Pillay Global-Asia Programme to research superconductivity in twisted bilayer graphene.</li><li>• Coded and ran over 20 different simulations using <b>MATLAB</b> and <b>Python</b> to determine the electronic band properties of superconductive twisted bilayer graphene.</li><li>• Presented relevant papers and research findings in group meetings and weekly journal clubs.</li><li>• Published results of research in <i>Solid State Communications</i>. This work has received over 60 citations.</li></ul>	

## OTHER PROFESSIONAL EXPERIENCE

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### **Open Ventilator System Initiative (OVSI)**

*Engineer / Engineering Coordinator*

University of Cambridge

March 2020 – June 2020

- Collaborated on designing and prototyping 3 different versions of an affordable, hospital-quality, ventilator system that is manufacturable and maintainable in low and middle-income countries.
- Managed information sharing and co-development between engineering groups in the United Kingdom, Kenya, Uganda, and Ethiopia.
- Received Presidents Special Award for Pandemic Service from Royal Academy of Engineering for contributions to addressing the challenges of the COVID-19 pandemic.

### **United Nations Office for Outer Space Affairs**

*Online Volunteer*

United Nations

December 2018 – March 2019

- Researched the applicability of methodologies for wastewater recycling and water management to achieve UN Sustainable Development Goal 6: Sustainable Management of Water and Sanitation for All.
- Wrote scientific-communication articles which explain the potential applications of technologies designed for use in outer space for water management on Earth.

## PUBLICATIONS AND PRESENTATIONS

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### **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

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### **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

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### **Computer Languages**

C, C++, MATLAB, Python

### **Software & Tools**

Creo, LabVIEW, Mathematica, Microsoft Office