

# Charles Tschirhart

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## EDUCATION AND EMPLOYMENT

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**KIC Postdoctoral Fellow, Cornell University** 2023-Present

**University of California, Santa Barbara**

PhD, Experimental Physics 2016-2023  
Thesis adviser: Andrea Young

**University of Nottingham**

Research staff, experimental physics, Fulbright scholarship 2015-2016

**California Institute of Technology**

Bachelor of Science in Applied Physics, with Honors 2011-2015

Bachelor of Science in Chemistry, with Honors 2011-2015

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## PUBLICATIONS AND PATENTS

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“Intervalley coherence and intrinsic spin-orbit coupling in rhombohedral trilayer graphene”

T. Arp\*, O. Sheekey\*, Haoxin Zhou, C. L. Tschirhart, Caitlin L. Patterson, H. M. Yoo, Ludwig Holleis, Evgeny Redekop, Grigory Babikyan, Tian Xie, Jiewen Xiao, Yaar Vituri, Tobias Holder, Takashi Taniguchi, Kenji Watanabe, Martin E. Huber, Erez Berg, Andrea F. Young  
Nature Physics, awaiting publication 2024

“Realization of the Haldane Chern insulator in a moiré lattice”

Wenjin Zhao, Kaifei Kang, Lizhong Li, C. L. Tschirhart, Evgeny Redekop, Kenji Watanabe, Takashi Taniguchi, Andrea Young, Jie Shan, Kin Fai Mak  
Nature Physics, DOI: <https://doi.org/10.1038/s41567-023-02284-0> 2023

“Intrinsic spin Hall torque in a moiré Chern magnet”

C. L. Tschirhart\*, Evgeny Redekop\*, Lizhong Li, Tingxin Li, Shengwei Jiang, T. Arp, O. Sheekey, Takashi Taniguchi, Kenji Watanabe, M. E. Huber, Kin Fai Mak, Jie Shan, A. F. Young  
Nature Physics **19**, 807-813 (2023), DOI: <https://doi.org/10.1038/s41567-023-01979-8> 2023

“Imaging orbital ferromagnetism in a moiré Chern insulator”

C. L. Tschirhart\*, M. Serlin\*, H. Polshyn, A. Shragai, Z. Xia, J. Zhu, Y. Zhang, K. Watanabe, T. Taniguchi, M. E. Huber, A. F. Young  
Science **372**, 1323-1327 (2021), DOI: [10.1126/science.abd3190](https://doi.org/10.1126/science.abd3190) 2021

“Electrical switching of magnetic order in an orbital Chern insulator”

H. Polshyn, J. Zhu, M. A. Kumar, Y. Zhang, F. Yang, C. L. Tschirhart, M. Serlin, K. Watanabe, T. Taniguchi, A. H. MacDonald, A. F. Young  
Nature **588**, 66-70 (2020), DOI: <https://doi.org/10.1038/s41586-020-2963-8> 2020

“Intrinsic quantized anomalous Hall effect in a moiré heterostructure”

M. Serlin\*, C. L. Tschirhart\*, H. Polshyn\*, Y. Zhang, J. Zhu, K. Watanabe, T. Taniguchi, L. Balents, A. F. Young  
Science **367**, 900-903 (2020), DOI: [10.1126/science.aay5533](https://doi.org/10.1126/science.aay5533) 2020

“Nanopillar field-effect and junction transistors with functionalized gate and base electrodes”, Patent number: 9966443

Aditya Rajagopal, Chieh-feng Chang, Oliver Plettenburg, Stefan Petry, Axel Scherer, Charles L. Tschirhart 2018

## SELECTED PRESENTATIONS

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<i>March Meeting 2023- American Physical Society</i>	2023
<i>Invited speaker: "Electrical control of magnetism in magnetic Chern insulators"</i>	
<i>Fall Meeting and Exhibit- Materials Research Society</i>	2022
<i>Invited speaker: "Electronic control of magnetism in magnetic Chern insulators"</i>	
<i>The Physics of Topological and Correlated Matter- Institute for Basic Science: Center for Theoretical Physics of Complex Systems</i>	2022
<i>"Electrical switching of magnetic order in intrinsic Chern insulators"</i>	
<i>Graphene and Beyond Workshop- Penn State</i>	2022
<i>"Electronic control of magnetism in magnetic Chern insulators"</i>	
<i>March Meeting 2022- American Physical Society</i>	2021
<i>"MoTe<sub>2</sub>/WSe<sub>2</sub>: current switching of magnetism in a Chern insulator"</i>	
<i>March Meeting 2021- American Physical Society</i>	2021
<i>"Probing orbital Chern ferromagnet phase in twisted bilayer graphene"</i>	
<i>Quantum materials symposium 2019- Oxford University</i>	2019
<i>"Intrinsic quantized anomalous Hall effect in twisted bilayer graphene"</i>	
<i>March Meeting 2019- American Physical Society</i>	2019
<i>"Imaging magnetic structure in Van der Waals ferromagnets using nanoSQUID microscopy"</i>	
<i>March Meeting 2018- American Physical Society</i>	2018
<i>"Construction of a 4.2 K scanning nanoSQUID-on-tip microscope incorporating topographic feedback"</i>	
<i>March Meeting 2014- American Physical Society</i>	2014
<i>"Frictional response of molecularly thin liquid polymer films subject to constant shear stress"</i>	

## HONORS AND AWARDS

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<i>Fannie and John Hertz Foundation Graduate Fellowship</i>	2016-2022
<i>National Science Foundation Graduate Fellowship</i>	2016-2022
<i>Fulbright Scholarship- United States Cultural Exchanges Program</i>	2015-2016
<i>Barry M. Goldwater Scholarship- ACT Organization</i>	2014
<i>Hixon Prize- California Institute of Technology</i>	2012
<i>Hallett Smith Prize- California Institute of Technology</i>	2012
<i>Brewer Prize- California Institute of Technology</i>	2011
<i>Fermilab Research Alliance Scholarship- Fermilab</i>	2011

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