Sebastian Hurtado Parra

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Education:

Ph.D. candidate, *Department of Physics and Astronomy, University of Pennsylvania,* 3.88 GPA
B.S. in Physics and Mathematics, *Saint Joseph's University, May 2015,* 3.8 GPA

Current Research Projects:

Ultrafast Optical Spectroscopy of Hybrid Organic-Inorganic Perovskites (HOIPs):
Though the last several years have seen rapid improvements in reported photovoltaic performance of perovskite-based solar cells, the underlying photophysics of perovskites remain under debate. I am expoloring the nature of photoexcited states in low-dimensional perovskites, with a focus on developing optical measurement techniques that allow for broadband spectral detection at a sub-picosecond timescale. This work has highlighted the importance of the interaction between photoexcited states and the crystalline lattice.

Transport Measurements of Graphene-Based Materials:
Multilayer graphene holds exciting potential for electronic, spintronic, and valleytronic applications due to its unique band structure. I study properties of this band structure using electronic transport measurements of multilayer graphene devices down to cryogenic temperatures and high magnetic fields.

Optical Imaging of Liquid Crystals in Magnetic Fields:
The behavior of liquid crystals under a magnetic field is predicted by theory but has not been proven by experiment. I helped design and build an optical microsocopy setup with the capability of reaching record magnetic fields for this type of experiment. This work will not only help validate theoretical predictions, but it could also open up a novel way of reliably measuring anchoring strength at liquid crystal interfaces.

Publications:

D. B. Straus, **S. Hurtado Parra**, N. Iotov, J. Gebhardt, A. M. Rappe, J. E. Subotnik, J. M. Kikkawa, and C. R. Kagan, *JACS* (2016) **138**, 13798 *DOI link*

Z. Gao, S. Wang, J. Berry, Q. Zhang, J. Gebhardt, W. M. Parkin, J. Avila, H. Yi, C. Chen, **S. Hurtado-Parra**, M. Drndić, A. M. Rappe, D. J. Srolovitz, J. M. Kikkawa, Z. Luo, M. C. Asensio, F. Wang, and A. T. C. Johnson, *Nat Commun* **11**, 546 (2020) *DOI link*

K. Du, S. D. Zemerov, **S. Hurtado-Parra**, J. M. Kikkawa, and I. J. Dmochowski, *Inorg Chem DOI link*

D. B. Straus, **S. Hurtado-Parra**, N. Iotov, Q. Zhao, M. R. Gau, P. J. Carroll, J. M. Kikkawa, and C. R. Kagan, *ACSNano* (2020) **14**, 3621 *DOI link*

D Khadka, T. R. Thapaliya, **S. Hurtado Parra**, X. Han, J. Wen, R. F. Need, P. Khanal, W. Wang, J. Zang, J. M. Kikkawa, L. Wu, S. X. Huang, *Science Advances, accepted* (2020)

Q. Zhang, S. Wang, Z. Gao, **S. Hurtado-Parra**, J. Berry, Z. Addison, P. M. Dais, W. M. Parkin, M. Drndic, J. M. Kikkawa, F. Wang, E. J. Mele, Z. Luo, A. T. C. Johnson, *submitted* (2020)

D Khadka, T. R. Thapaliya, **S. Hurtado Parra**, J. Wen, R. Need, J. M. Kikkawa, S. X. Huang, *submitted* (2020)

Technical Skills:

Laser optics
Cryogen/Cryogen-less low temperature systems
Instrument automation & data analysis using: LabVIEW, Python, C/C++
Metal Machining

Other Skills:

Native bilingual fluency in English and Spanish

Awards and Honors

University of Pennsylvania, *2019 Arnold M. Denenstein Prize*
PennApps XV, *Top 30 (Cryptoino): project link*
PennApps XIV, *3rd Place (EyeHUD): project link*
Phi Beta Kappa Honors Society
Sigma Pi Sigma Physics Honors Society
Sigma Xi Scientific Research Honors Society
Pi Mu Epsilon Mathematics Honors Society
University of Pennsylvania, *2014 LRSM REU*
University of Chicago, *2013 Physics REU*
Saint Joseph's University, *2012 & 2014 Summer Scholars Program*

Teaching Experience:

Teaching Assistant: *University of Pennsylvania (2016-present)*
Laboratory Teaching Assistant: *Saint Joseph's University (2013-2014)*
Tutor/Supplemental Instruction Leader: *Saint Joseph's University (2012-2015)*

Personal Reference:

Ph.D. Advisor
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(215) 898-7522