Kort Beck

B.Sc. in Physics Engineering
M.Sc. in Physics
Ph.D. Physics student

kgr6@illinois.edu | kortbeck.com | Illinois.edu/kortbeck | iNSPIRE | ORCID | Newspaper Column

Education

2022 - Present **University of Illinois at Urbana-Champaign, Department of Physics**,
Ph.D. Physics student , Supervised by Dr. Patrick Draper.
Worked on aspects of strongly coupled gauge theories, in particular on constraining the low-energy dynamics of 4d SU(N) anomaly-free and asymptotically free chiral gauge theories with a focus on higher-form 't Hooft anomaly matching.

2022 - 2025 **University of Illinois at Urbana-Champaign, Department of Physics**,
Master of Science in Physics.

2016 - 2021 **Autonomous University of Coahuila, Department of Physics and Mathematics**,
B.Sc. in Physics Engineering, Supervised by Dr. Simón Rodríguez Rodríguez.
Thesis project: *Isospin doublet under the (1,0)⊕(0,1) Lorentz group representation as a model for dark matter.*

Publications

September 2026 **On asymptotically and anomaly-free SU(N) chiral gauge theories for arbitrarily large N** ,
arXiv:2609.21129, (2026) .

September 2022 **Comment on "Spin correlations in elastic e^+e^- scattering in QED"**, arXiv:2209.13986.
The European Physical Journal D, **77**, 85, (2023). doi : 10.1140/epjd/s10053-023-00665-x.

August 2022 **Bachelor Thesis. Doblete de isoespín en la representación $(1,0)\oplus(0,1)$ del grupo de Lorentz como modelo de materia oscura**, doi: 10.13140/RG.2.2.13440.30722 .

Talks, workshops and summer schools

June 2026 **Simons Center for Geometry and Physics**, *Stony Brook, New York, USA*,
Paths to Quantum Field Theory workshop.

April 2026 **University of Notre Dame, Department of Physics**, *South Bend, Indiana, USA*,
PIKIMO 20, Research talk.

March 2026 **Universidad Nacional Autónoma de México (UNAM), Institue of Physis (IF)**, *Ciudad de México, México*,
Student seminar, Research talk.

August 2025 **Carl R. Woese Institute for Genomic Biology & Department of Physics**,
University of Illinois Urbana-Champaign,
Summer School in Quantitative Cell Biology, supervised by Dr. Ido Golding.
Training on MINFLUX microscope manipulation to track molecules inside living cells at 2 nanometer resolution.

June 2023 **Perimeter Institute for Theoretical Physics**, *Waterloo, Ontario, Canada*,
Tri-Institute Summer School on Elementary Particles, TRISEP.

Research experience

August 2022 - Present **University of Illinois at Urbana-Champaign**, *Urbana, Illinois, USA*,
Member of Dr. Patrick Draper's high energy theory research group.
Worked on aspects of strongly coupled chiral gauge theories.

August 2021 - August 2022 **University of Colima**, *Colima, Colima, México*,
Member of Dr. Alfredo Aranda's research group.
Worked on physics of entanglement in scattering amplitudes.

June - August 2021 **University of Colima**, *Colima, Colima, México*,
Summer student , Supervised by Dr. Alfredo Aranda.

October 2020 **Autonomous University of Coahuila**, *Saltillo, Coahuila, México*.
Collaboration with chemistry department student s on a food science research project.
My contribution focused on the mathematical modeling of the studied phenomena, doi : 10.1016/j.fpsl.2021.100734.

August 2020 **Centro de Investigación Científica y de Educación Superior de Ensenada, CICESE**, *Ensenada, Baja California, México*,
Summer student (virtually), supervised by Dr. Paulina Segovia.
Worked in simulations of localized surface plasmons in star shaped silver nanoparticles using COMSOL.

June - August 2020 **Autonomous University of Coahuila**, *Saltillo, Coahuila, México*,
Summer studnet, supervised by Dr. Carlos Rodríguez.
Worked in the synthesis and characterization of $BaLaAlO_4$ doped with Erbium. A potential application of this material is to produce cheap novel RGB diodes.

June 2020 - August 2021 **Autonomous University of Coahuila, Department of Physics and Mathematics**, *Saltillo, Coahuila, México*,
Thesis research project, supervised by Dr. Simón Rodríguez Rodríguez.
A gauge structure for fields transforming under the $(1,0)\oplus(0,1)$ Lorentz group representation is proposed as a model for dark matter. The spin independent cross section for WIMP - Xe nuclei interaction was calculated in this model and compared with the XENON1T 2017 results.

June - July 2018 **Autonomous University of Puebla, BUAP**, *Puebla, México*,
Summer student, supervised by Dr. Cecilia Uribe.
Worked in Resistive Plate Chamber (RPC) detectors simulations via Python, in particular muon detection.

Other positions

July 2025 - Present **Vanguardia**, *Saltillo, Coahuila, México*,
Writer, Opinion columnist.
Author of "*Relativo a la Naturaleza*", a column on mathematics, science, and education for Coahuila's leading regional daily Vanguardia.

June - August 2024 **University of Illinois at Urbana-Champaign**, *Urbana, Illinois, USA*,
Intern, Student Academic Affairs Office, College of Liberal Arts & Sciences.
Curated a database mapping partner institutions' academic offerings to University of Illinois curricula, enabling students to identify courses abroad that count toward their degree requirements.

Awards

2026 - 2027 **Mavis Future Faculty Fellow**,
$2,000 USD, Grainger College of Engineering, University of Illinois at Urbana-Champaign.

February 2026 ***Por Un Buen Camino* scholarship**,
$1,000 USD, University of Illinois Lambda Upsilon Lambda ($\Lambda\Upsilon\Lambda$) Fraternity.

November 2025 **SHPE scholarship**,
$2,000 USD, Society of Hispanic Professional Engineers, SHPE.

November 2022 **Premio Talento Coahuila Jóvenes Científicos. Category: Scientific research**,
$3,200 USD, Consejo Estatal de Ciencia y Tecnología (COECYT), Saltillo, Coahuila, México.
This award recognizes outstanding research and science outreach trajectories of young students from Coahuila, México.

November 2020 ***Presea Lobo***,
Autonomous University of Coahuila (UAdeC), Saltillo, Coahuila, México.
The highest honor awarded by UAdeC for students. Awarded in the leadership category.

Teaching experience

2022 - present **University of Illinois at Urbana-Champaign, Department of Physics**, *Urbana, Illinois, USA*,
Teaching Assistant.
Courses: PHYS 102 (*College Physics: E&M & Modern*), PHYS 211 (*University Physics: Mechanics*), PHYS 213 (*University Physics: Thermal Physics*), PHYS 485 (*Atomic Physics & Quantum Theory*), PHYS 470 (*Subatomic Physics*), PHYS 575 (*Graduate Particle Physics I*).

December 2020 **Technological Saltillo Institute**, *Saltillo, Coahuila, México*,
Guest teacher.
I taught a basic introductory course on quantum mechanics for senior Materials Engineering student s.

Science outreach

2025-2026 **Pint of Science US**, *Urbana, Illinois, USA*,
Co-organizer, 2025 and 2026 Urbana-Champaign chapter.
Pint of Science is an international festival that brings scientists to local public spaces to discuss their latest research and findings with a general audience.

2025 **Pint of Science US**, *Urbana, Illinois, USA*,
Speaker, Talk title: "The Fundamental Ingredients of Our Universe"..

2018-2021 **Autonomous University of Coahuila, UAdeC**, *Saltillo, Coahuila, México*.
Co-founder of "Divulgatrón", the first official science outreach group at UAdeC Department of Physics and Mathematics. Our goal was to share science with the general public. In 2018 and 2019 we participated in the national reunion for science outreach organized by the Mexican Society of Physics.

2020 - 2021 **Youth Scientific Society, SCJ**, *Saltillo, Coahuila, México*.
President of the Youth Scientific Society, Saltillo Coahuila chapter, in association with the International Association of Physics student s (IAPS).

Certifications

February 2021 **Fluid Dynamics with ANSYS Fluent**, Virtually.
SEI, Specialized Services in Engineering. Instructed by Dr. Pedro Lopez, Carleton University.

Skills

Programming C, C++, Python
Software LaTeX, Linux/Ubuntu, Mathematica
Other Experience on numerical simulation

Langauges

Spanish **Native langauge**
English