Stanford

# Natalia Toro

Professor of Particle Physics and Astrophysics

## Bio

### ACADEMIC APPOINTMENTS

- Professor, Particle Physics and Astrophysics

### BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Executive Committee Member at Large, APS Division of Particles and Fields (2019 - present)
- Experimental Advisory Committee member, SNOLAB (2012 - 2015)

### PROFESSIONAL EDUCATION

- PhD, Harvard University , Physics (2007)
- S.B., MIT , Physics and Mathematics (2003)

### LINKS

- Website: https://www.slac.stanford.edu/~ntoro/

## Teaching

### STANFORD ADVISEES

**Doctoral Dissertation Reader (AC)**

Elizabeth Berzin, Shayarneel Kundu, Gowri Sundaresan

**Doctoral Dissertation Advisor (AC)**

Federico Pavone, Alessandro Russo

## Publications

### PUBLICATIONS

- **Axion dark matter detection by superconducting resonant frequency conversion** *JOURNAL OF HIGH ENERGY PHYSICS*
  Berlin, A., D'Agnolo, R., Ellis, S. A. R., Nantista, C., Neilson, J., Schuster, P., Tantawi, S., Toro, N., Zhou, K.
  2020
- **A high efficiency photon veto for the Light Dark Matter eXperiment** *JOURNAL OF HIGH ENERGY PHYSICS*
  Akesson, T., Blinov, N., Bryngemark, L., Colegrove, O., Collura, G., Dukes, C., Dutta, V., Echenard, B., Eichlersmith, T., Group, C., Hiltbrand, J., Hitlin, D. G., Incandela, et al
  2020
- **Lepton-nucleus cross section measurements for DUNE with the LDMX detector** *PHYSICAL REVIEW D*
  Ankowski, A. M., Friedland, A., Li, S., Moreno, O., Schuster, P., Toro, N., Tran, N.
  2020; 101 (5)
- **Directly Deflecting Particle Dark Matter** *PHYSICAL REVIEW LETTERS*
  Berlin, A., D'Agnolo, R., Ellis, S. A. R., Schuster, P., Toro, N.

2020; 124 (1): 011801

- **Dark matter, millicharges, axion and scalar particles, gauge bosons, and other new physics with LDMX** *PHYSICAL REVIEW D*
  Berlin, A., Blinov, N., Krnjaic, G., Schuster, P., Toro, N.
  2019; 99 (7)
- **Search for a dark photon in electroproduced e(+)e(-) pairs with the Heavy Photon Search experiment at JLab** *PHYSICAL REVIEW D*
  Adrian, P. H., Baltzell, N. A., Battaglieri, M., Bondi, M., Boyarinov, S., Bueltmann, S., Burkert, V. D., Calvo, D., Carpinelli, M., Celentano, A., Charles, G., Colaneri, L., Cooper, et al
  2018; 98 (9)
- **Dark sectors at the Fermilab SeaQuest experiment** *PHYSICAL REVIEW D*
  Berlin, A., Gori, S., Schuster, P., Toro, N.
  2018; 98 (3)
- **Cosmology and accelerator tests of strongly interacting dark matter** *PHYSICAL REVIEW D*
  Berlin, A., Blinov, N., Gori, S., Schuster, P., Toro, N.
  2018; 97 (5)
- **Analyzing the Discovery Potential for Light Dark Matter** *PHYSICAL REVIEW LETTERS*
  Izaguirre, E., Krnjaic, G., Schuster, P., Toro, N.
  2015; 115 (25): 251301
- **Testing GeV-scale dark matter with fixed-target missing momentum experiments** *PHYSICAL REVIEW D*
  Izaguirre, E., Krnjaic, G., Schuster, P., Toro, N.
  2015; 91 (9)
- **A new class of particle in 2+1 dimensions** *PHYSICS LETTERS B*
  Schuster, P., Toro, N.
  2015; 743: 224–27
- **The Heavy Photon Search test detector** *NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT*
  Battaglieri, M. a., Boyarinov, S. b., Bueltmann, S. c., Burkert, V. b., Celentano, A. a., CHARLES, G. F., COOPER, W. D., Cuevas, C. b., Dashyan, N. e., DeVita, R. a., Desnault, C. f., Deur, A. b., Egiyan, et al
  2015; 777: 91-101
- **Continuous-spin particle field theory with helicity correspondence** *PHYSICAL REVIEW D*
  Schuster, P., Toro, N.
  2015; 91 (2)
- **Physics motivation for a pilot dark matter search at Jefferson Laboratory** *PHYSICAL REVIEW D*
  Izaguirre, E., Krnjaic, G., Schuster, P., Toro, N.
  2014; 90 (1)
- **New electron beam-dump experiments to search for MeV to few-GeV dark matter** *PHYSICAL REVIEW D*
  Izaguirre, E., Krnjaic, G., Schuster, P., Toro, N.
  2013; 88 (11)
- **A gauge field theory of continuous-spin particles** *JOURNAL OF HIGH ENERGY PHYSICS*
  Schuster, P., Toro, N.
  2013
- **On the theory of continous-spin particles: helicity correspondence in radiation and forces** *JOURNAL OF HIGH ENERGY PHYSICS*
  Schuster, P., Toro, N.
  2013
- **On the theory of continous-spin particles: wavefunctions and soft-factor scattering amplitudes** *JOURNAL OF HIGH ENERGY PHYSICS*
  Schuster, P., Toro, N.
  2013

- **Study of LHC searches for a lepton and many jets** *JOURNAL OF HIGH ENERGY PHYSICS*
  Lisanti, M., Schuster, P., Strassler, M., Toro, N.
  2012
- **Sommerfeld-enhanced annihilation in dark matter substructure: Consequences for constraints on cosmic-ray excesses** *PHYSICAL REVIEW D*
  Slatyer, T. R., Toro, N., Weiner, N.
  2012; 86 (8)
- **Simplified models for LHC new physics searches** *JOURNAL OF PHYSICS G-NUCLEAR AND PARTICLE PHYSICS*
  Alves, D., Arkani-Hamed, N., Arora, S., Bai, Y., Baumgart, M., Berger, J., Buckley, M., Butler, B., Chang, S., Cheng, H., Cheung, C., Chivukula, R. S., Cho, et al
  2012; 39 (10)
- **Multiphotons and photon jets from new heavy vector bosons** *PHYSICAL REVIEW D*
  Toro, N., Yavin, I.
  2012; 86 (5)
- **Search for a New Gauge Boson in Electron-Nucleus Fixed-Target Scattering by the APEX Experiment** *PHYSICAL REVIEW LETTERS*
  Abrahamyan, S., Ahmed, Z., Allada, K., Anez, D., Averett, T., Barbieri, A., Bartlett, K., Beacham, J., Bono, J., Boyce, J. R., Brindza, P., Camsonne, A., Cranmer, et al
  2011; 107 (19)
- **An electron fixed target experiment to search for a new vector boson A ' decaying to e(+)e(-)** *JOURNAL OF HIGH ENERGY PHYSICS*
  Essig, R., Schuster, P., Toro, N., Wojtsekhowski, B.
  2011
- **High energy electron signals from dark matter annihilation in the Sun** *PHYSICAL REVIEW D*
  Schuster, P., Toro, N., Weiner, N., Yavin, I.
  2010; 82 (11)
- **Discovering new light states at neutrino experiments** *PHYSICAL REVIEW D*
  Essig, R., Harnik, R., Kaplan, J., Toro, N.
  2010; 82 (11)
- **Physics with the KLOE-2 experiment at the upgraded DA Phi NE** *EUROPEAN PHYSICAL JOURNAL C*
  Amelino-Camelia, G., Archilli, F., Babusci, D., Badoni, D., Bencivenni, G., Bernabeu, J., Bertlmann, R. A., Boito, D. R., Bini, C., Bloise, C., BOCCI, V., Bossi, F., Branchini, et al
  2010; 68 (3-4): 619-681
- **Terrestrial and solar limits on long-lived particles in a dark sector** *PHYSICAL REVIEW D*
  Schuster, P., Toro, N., Yavin, I.
  2010; 81 (1)
- **New fixed-target experiments to search for dark gauge forces** *PHYSICAL REVIEW D*
  Bjorken, J. D., Essig, R., Schuster, P., Toro, N.
  2009; 80 (7)
- **Probing dark forces and light hidden sectors at low-energy e(+)e(-) colliders** *PHYSICAL REVIEW D*
  Essig, R., Schuster, P., Toro, N.
  2009; 80 (1)
- **Constructing the tree-level Yang-Mills S-matrix using complex factorization** *JOURNAL OF HIGH ENERGY PHYSICS*
  Schuster, P. C., Toro, N.
  2009
- **Simplified models for a first characterization of new physics at the LHC** *PHYSICAL REVIEW D*
  Alwall, J., Schuster, P. C., Toro, N.
  2009; 79 (7)