

KAVLI INSTITUTE FOR THEORETICAL PHYSICS

Presents

The Seventy-Fifth KITP Public Lecture

Sponsored by Friends of KITP

Jairo Sinova

From Magnetic Cats to Artificial Intelligence: The Circular Technological Revolution of Spintronics

We live in a multi-connected world of information technology. For better or worse, our destiny is linked to the technology which we depend upon. It has changed the way we interact, live, and influence our planet. Information technology uses the electrons of atoms for both computing, by using their charge, and in storing of information, by using the spin of electrons in magnetic materials. In the mid-2000s we saw an analog to digital revolution facilitated by the high-density information hard drives that gave rise to the Cloud. Today the new direction of storage technology focuses on doing away with hard drive technology and going towards an all electrical version in which charge-current and spin-currents are combined to flip magnets and create efficient Magnetic-Random-Access-Memories (MRAMs). The revolution is just beginning, however. In 2015 we created “antiferromagnetic cats” with properties that can be used for Artificial Intelligence Neural Networks. This has given rise to a revolution that has revolved in itself. Having gone from analog to digital in the late 2000s, we are coming back to analog to search for efficient materials that can compute with the power and efficiency of the brain but at much higher speeds.

About the Speaker

Born in 1972, Jairo Sinova is an Alexander von Humboldt Professor of Physics at Johannes Gutenberg Universität Mainz. After completing his doctorate at Indiana University in 1999, he became a postdoc at the University of Tennessee and the University of Texas at Austin before becoming a Professor of Physics at Texas A&M University in 2003. Among his honors, he has received the Alexander von Humboldt Professorship Award, the Johannes Gutenberg Research Fellowship, the ERC Advance Synergy Grant, National Science Foundation’s Career Award, the Cottrell Scholar Award, and was elected in 2011 a Fellow of the American Physical Society. He works primarily in the field of spintronics where the magnetic and electric properties of materials merge in new ways by using Einstein’s theory of relativity, which acts as the link between these properties. His work aims at understanding the complex quantum world of solids with the long term goal of finding better and more energy efficient ways to process and store information.

Wednesday, October 30th, 2019
7:00 PM (reserved seats held until 6:50 PM)

Kavli Institute for Theoretical Physics, Main Seminar Room



Admission is Free
RSVP for Reserved Seating
by FRIDAY, October
25th

at:

[http://www.kitp.ucsb.edu/
public-lecture-rsvp](http://www.kitp.ucsb.edu/public-lecture-rsvp)

or call

(805) 893-6307

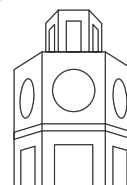
Reserved seats are held
until 6:50 PM

*To make special arrangements to
accommodate a disability, call the*

LOT 10 PARKING

From the roundabout at Hwy 217, turn right onto Mesa Rd, merge into the left lane, and turn left at the first light into Lot 10 parking structure. **PARK, BUY a \$4 permit** from the dispenser (near the elevator and stairs), and **DISPLAY PERMIT** on dashboard. The KITP is right next door in Kohn Hall.

*The KITP gratefully acknowledges its
many friends in the community.*



KITP
PUBLIC
LECTURE
SERIES