




## Shoucheng Zhang

J. G. Jackson and C. J. Wood Professor of Physics and Professor, by courtesy, of Applied Physics

 Curriculum Vitae available Online

### CONTACT INFORMATION

#### • Alternate Contact

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### Bio

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#### BIO

Can states of matter take other forms besides the three familiar ones, namely gas, liquid, and solid?

Indeed, laws of quantum mechanics predict many other interesting states of matter; for example, states displaying superconductivity and the quantum Hall effect.

Professor Zhang's group investigates the quantum physics of many interacting electrons. Recently, his group predicted a new electronic state that displays the quantum spin Hall effect without any external magnetic fields.

This effect has been subsequently observed experimentally. Beyond the fundamental importance of new states of matter, electronic circuits operating on these new principles could also offer alternatives to the current semiconductor chips, and extend the reach of Moore's law.

Current areas of Focus:

- High temperature superconductivity
- Quantum Spintronics
- Quantum spin Hall effect
- Magnetism

#### ACADEMIC APPOINTMENTS

- Professor, Physics
- Professor (By courtesy), Applied Physics

#### ADMINISTRATIVE APPOINTMENTS

- Postdoctoral Fellow, Institute for Theoretical Physics - University of California, Santa Barbara, (1987-1989)
- Research Staff Member, IBM Almaden Research Center, (1989-1993)
- Professor of Physics, Stanford University, (1993- present)
- Professor of Applied Physics, by courtesy, Stanford University, (1995- present)

- Co-Director at IBM, Stanford Center for Spintronics Science and Application Center, (2004- present)
- Professor of Electrical Engineering, by courtesy, Stanford University, (2004- present)
- Professor in Physics, J.G. Jackson and C.J. Wood, (2010- present)

## HONORS AND AWARDS

- The Dirac Medal, International Centre for Theoretical Physics (2012)
- Award, Fellowship, American Academy of Arts and Sciences (2011)

## PROFESSIONAL EDUCATION

- B.S., Free University of Berlin, Germany , Physics (1983)
- Ph.D., State University of New York, at Stonybrook , Physics (1987)

## LINKS

- Stanford Faculty, Department of Physics: <https://physics.stanford.edu/people/faculty/shoucheng-zhang>

## Teaching

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### COURSES

#### 2017-18

- Topics in Modern Condensed Matter Theory I: Topological States of Matter: PHYSICS 470 (Win)

#### 2016-17

- Science on the Back of the Envelope: PHYSICS 81N (Win)

#### 2015-16

- Science on the Back of the Envelope: PHYSICS 81N (Aut)
- Thermodynamics, Kinetic Theory, and Statistical Mechanics II: PHYSICS 171 (Win)

#### 2014-15

- Continuum Mechanics: PHYSICS 211 (Win)
- Science on the Back of the Envelope: PHYSICS 81N (Aut)