

# KAVLI INSTITUTE FOR THEORETICAL PHYSICS

*Presents*

## *The Sixty-Third KITP Public Lecture*

Sponsored by Friends of KITP

# Zvi Bern

## Do I have to draw you a diagram?

A tale of quantum gravity

**A**lmost all theoretical physicists believe that quantum field theories based on Einstein's general relativity must necessarily be ill-defined. In technical parlance this is known as the "ultraviolet problem" of quantum gravity. But, is there *really* a problem? New insights and calculations based on the concept that gravity can be expressed in terms of two copies of standard particle theories suggest that quantum gravity may be much, much tamer. It may even be what is called "ultraviolet finite". The relationship between gravity and gauge theories (which I will explain) also offers the hope of simplifying Einstein's theory, as will be illustrated using black holes.

### About the Speaker

Zvi Bern studied at MIT and UC Berkeley, and traveled the globe as a postdoc before joining the UCLA Physics Department, where he is currently Professor of Physics. He has won numerous awards, including the 2014 Sakurai Prize from the American Physical Society, shared with Lance Dixon and David Kosower. He'd like to find out how particles scatter off each other by bypassing complexities inherent in Feynman diagrams. This has applications to the LHC at CERN, and, on the more theoretical side, to supersymmetric gauge and gravity theories. Bern first got into physics by striving to be like his older brother, who was learning electrical engineering. But because he didn't really understand electronics, he decided to read about physics to help with the fundamentals. He never became a radio engineer, but, as a consolation prize, he did get to understand quantum field theory.

**Wednesday, April 20, 2016**  
**8:00 PM (reserved seats held until 7:50 PM)**



**Admission is Free**

*RSVP by April 18 at*

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

*or call*

**(805) 893-6363**

**There will be open seating  
but a reservation is required**

**KOHN HALL**  
*Main Seminar Room*

### LOT 10 PARKING

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

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

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