

# Rukmini Dey

## Research Summary:

I worked out the geometric prequantization of the vortex moduli space and the Hitchin systems. The first turns out to have a family of symplectic structures and the second a hyperKähler structure. I could geometrically prequantize these structures. It remains to be seen if these come from some Conformal Field theories.

I have been working on a geometry problem to do with existence of Constant Mean curvature surfaces spanning several curves.

I have also been working on a topology problem to do with generalizing Neilsen fixed point theory using fiber bundles instead of universal covering space theory

## Publications:

1. Rukmini Dey *Geometric quantization of the moduli space of the self-duality equations on a Riemann surface*  
Reports on Mathematical Physics Vol. 57 no. 2, pg. 179-188 (2006)  
math-phy/0605026
2. Rukmini Dey *Geometric prequantization of the moduli space of the vortex equations on a Riemann surface*  
Journal of Mathematical Physics, vol. 47, issue 10, page 103501  
math-phy/0605025

## Preprints:

1. Rukmini Dey, *HyperKähler prequantization of the Hitchin systems and Chern-Simons gauge theory with complex gauge group* (in preparation, draft in math-phy/06050270)

## Conference/Workshops Attended:

1. *New Developments in the geometry and physics of Gromov-Witten theory*, MSRI, USA, May, 2006.

## Visits to other Institutes:

1. MSRI, Berkeley, USA, May 2006

2. University of Harvard, place, USA, April, 2006
3. University of California at Los Angeles, USA, May 2006
4. TIFR, Mumbai, India, June 2006

### **Invited Lectures/Seminars:**

1. *Geometric quantization of the hyperKähler structure of the Hitchin system and the vortex moduli space*, MSRI, USA, Berkeley May, 2006.
2. *same talk*, University of Harvard, Cambridge, USA, April, 2006.
3. *same talk*, UCLA, California, USA, May 2006.
4. *same talk*, TIFR, Mumbai,India, June 2006.

### **Other Activities:**

1. Looking after the running of a school for underprivileged children on campus
2. As a member of the Worker's Contract Committee and as a part of the minimum wage team, I am working towards getting minimum wage for everyone working in the campus premises.