

# ACADEMIC EXPERIENCE

PARTHA MUKHOPADHYAY



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## POSITIONS

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### **The Institute of Mathematical Sciences Chennai TN India**

*Faculty of Theoretical Physics*

*2008 – Present*

- Teaching and project guidance for graduate and undergraduate students in Theoretical Physics.
- Research
  - \* String Theory: string quantization in curved background, loop space framework, tubular geometry, covariant string bits.
  - \* Gravity: Dixon's framework of gravitational multiple moments, generalization to light-cone foliation, a configuration space approach to few body problem.
  - \* Quantum Field Theory: Construction of lattice models with manifest spacetime symmetries - both Poincaré and a class of generally covariant theories
- Conference organization.
- Journal paper review.

### **University of Kentucky Lexington KY USA**

*Visiting Scientist (sabbatical)*

*2020 – 2021*

- Weekly interaction with Theory Group, Physics & Astronomy.
- Research: Construction of Poincaré invariant lattice theory and discrete calculus.

*Visiting Professor*

*2007 – 2008*

- Undergraduate teaching: AST 192 - Stars, Galaxies and the Universe.
- Research: string quantization in pp-wave backgrounds.
- Journal paper review.

**University of Cambridge**  
**Cambridge, UK**

*Postdoctoral Research Associate (DAMTP<sup>1</sup>)*

2005 – 2007

- Research: pure spinor formalism of superstring theory, strings in pp-waves.
- Journal paper review.

**University of Kentucky**  
**Lexington KY USA**

*Postdoctoral Scholar*

2003 – 2005

- Research: 2D string theory, non-BPS D-branes in string theory.
- Journal paper review.

**Pennsylvania State University**  
**University Park PA USA**

*Visiting Graduate Student*

2001 – 2002

- Teaching Assistant in General Physics.
- Research: string field theory.

**Harish-Chandra Research Institute**  
**Prayagraj UP India**

*Graduate Student*

1997 – 2002

- Research: Green-Schwarz formalism of superstring theory, non-BPS D-branes, string field theory.
- Teaching Assistant in Quantum Field Theory.
- Special lectures on Physics for school students.

## NOTABLE VISITS

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**University of North Carolina**  
**Raleigh NC USA**

*Visiting Professor*

December 2024

**University of Kentucky**  
**Lexington KY USA**

*Visiting Professor*

December 2024 - February 2025

August – December 2023

May 2019

July – August 2016

**C. N. Yang Institute for Theoretical Physics, Stony Brook University**  
**Stony Brook NY USA**

*Visiting Professor*

September 2016

*Visiting Postdoc*

March 2006

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<sup>1</sup>Department of Applied Mathematics & Theoretical Physics

**McGill University**  
**Montreal, Canada**

*Visiting Professor*

*September 2016*

*October 2009*

**Bogoliubov Laboratory of Theoretical Physics, JINR**  
**Dubna, Russia**

*Visiting Professor*

*July – August 2015*

**Indian Association for the Cultivation of Science**  
**Kolkata WB India**

*Visiting Professor*

*March 2016*

*August 2008*

**Institute of Physics**  
**Bhubaneswar OD India**

*Visiting Professor*

*December 2014*

*March 2010*

**Harish-Chandra Research Institute**  
**Prayagraj UP India**

*Visiting Professor*

*October 2014*

*November 2011*

*April 2009*

**Joint Institute of Nuclear Research (JINR)**  
**Dubna, Russia**

*India-JINR forum*

*June 2014*

**Czech Technical University**  
**Prague, Czech Republic**

*Conference*

*August 2011*

**Tata Institute of Fundamental Research**  
**Mumbai MH India**

*Visiting Professor*

*September 2009*

**Centre for High Energy Physics, Indian Institute of Science**  
**Bangalore KA India**

*Visiting Professor*

*September 2009*

**Purdue University**  
**West Lafayette IN USA**

*Visiting Postdoc*

*October 2006*

**CERN, Theory Division**  
**Meyrin, Geneva, Switzerland**

*Visiting Researcher*

*June – July 2006*

**Enrico Fermi Institute, University of Chicago**  
**Chicago IL USA**

*Visiting Postdoc*

*March 2006*

**University of Southern California**  
**Los Angeles CA USA**

*Visiting Postdoc*

*March 2005*

**University of California, Los Angeles**  
**Los Angeles CA USA**

*Visiting Postdoc*

*March 2005*

**California Institute of Technology**  
**Pasadena CA USA**

*Visiting Postdoc*

*March 2005*

**DAMTP, University of Cambridge**  
**Cambridge, UK**

*Visiting Graduate Student*

*July 2004*

**The Michigan Center for Theoretical Physics, University of Michigan**  
**Ann Arbor MI USA**

*“Young String Theorist” junior visitor program*

*September 2003*

**Ohio State University**  
**Columbus OH USA**

*Visiting Graduate Student*

*January 2002*

**Kavli Institute for Theoretical Physics, UCSB**  
**Santa Barbara CA USA**

*Visiting Graduate Student*

*May – June 2001*

**International Centre for Theoretical Physics**  
**Trieste Italy**

*Visiting Graduate Student*

*April 2001*

**Indian Institute of Technology, Kharagpur**  
**Kharagpur WB India**

*Visiting Graduate Student*

*December 2000*

## **RESEARCH SEMINARS**

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### **Tempered Distribution Theory on a Lattice**

*University of Kentucky*  
*Lexington KY USA*

*January 2025*

### **A Proposal for a Symmetry Preserving UV Cutoff**

*North Carolina State University*  
*Raleigh NC USA*

*December 2024*

*Miami 2024 Physics Conference*  
*Miami FL USA*

### **Construction of Poincaré Invariant Theories on a Lattice**

*University of Kentucky*  
*Lexington KY USA*

*December 2023*

### **A Covariant Lattice Approach and its Application to String Bits**

*University of Kentucky*  
*Lexington KY USA*

*September 2020*

### **Covariant String Bits**

*Chennai Strings Meeting 2019*  
*Chennai TN India*

*November 2019*

### **A Non-perturbative Approach to Self-force Problem**

*University of Kentucky*  
*Lexington KY USA*

*May 2019*

### **Small String Quantization in Curved Space**

*Chennai Strings Meeting 2018*  
*Chennai TN India*

*October 2018*

### **Small String Quantization in Curved Space and Tubular Geometry**

*C. N. Yang Institute for Theoretical Physics*  
*Stony Brook NY USA*

*September 2016*

*McGill University*  
*Montreal, Canada*

*September 2016*

*University of Kentucky*  
*Lexington KY USA*

*August 2016*

## **Towards a Theory of Conformal String Bits**

*Indian Association for the Cultivation of Science  
Kolkata WB India*

*March 2016*

*Developments in String Perturbation Theory (workshop)  
Harish-Chandra Research Institute  
Prayagraj UP India*

*February 2016*

## **Tubular Geometry in Loop Space and Non-Linear Sigma Model**

*Supersymmetries and Quantum Symmetries - SQS'2015 (conference)  
Bogoliubov Laboratory of Theoretical Physics, JINR  
Dubna, Russia*

*August 2015*

## **Loop Space Quantum Mechanics**

*Bogoliubov Laboratory of Theoretical Physics, JINR  
Dubna, Russia*

*July 2015*

## **Strings in Curved Spacetime and Tubular Geometry**

*Institute of Physics  
Bhubaneswar OD India*

*December 2014*

*Harish-Chandra Research Institute  
Prayagraj UP India*

*February 2016*

## **Non-Linear Sigma Model, Loop Space and Tubular Geometry**

*Joint Institute for Nuclear Research (as part of India-JINR forum)  
Dubna, Russia*

*June 2014*

## **Towards a Loop Space Description of Non-linear Sigma Model**

*International Conference on Mathematical Modeling in Physical Sciences  
Budapest, Hungary*

*September 2012*

## **On a Semi-classical Limit of Loop Space Quantum Mechanics**

*National Strings Meeting  
University of Delhi  
Delhi UP India*

*December 2011*

*Harish-Chandra Research Institute  
Prayagraj UP India*

*November 2011*

## **Tubular Neighborhood of Target Manifold in Non-linear Sigma Model**

*Seventh International Symposium on Quantum Theory and Symmetries  
Czech Technical University  
Prague, Czech Republic*

*August 2011*

## **DeWitt-Virasoro Construction**

*Field Theoretic Aspects of Gravity (conference)*  
*H. N. B. Garhwal University*  
*Srinagar, India*

*April 2010*

## **From Worldsheet to Spacetime**

*Institute of Physics*  
*Bhubaneswar OD India*

*March 2010*

## **A Phase-Space Operator Method for String Worldsheet Theory and General Covariance**

*McGill University*  
*Montreal, Canada*

*October 2009*

*Tata Institute of Fundamental Research*  
*Mumbai MH India*

*September 2009*

*Centre for High Energy Physics, Indian Institute of Science*  
*Bangalore KA India*

*September 2009*

*Sixth International Symposium on Quantum Theory and Symmetries*  
*University of Kentucky*  
*Lexington KY USA*

*July 2009*

## **Conformal Invariance of Superstrings in Type IIB R-R Plane Wave Background**

*Harish-Chandra Research Institute*  
*Prayagraj UP India*

*April 2009*

## **Conformal Field Theories for Bosonic Strings in pp-Waves**

*Indian Association for the Cultivation of Science*  
*Kolkata WB India*

*August 2008*

## **A Universality in pp-Waves**

*Institute of Physics*  
*Bhubaneswar OD India*

*January 2007*

*Field Theoretic Aspects of Gravity (conference)*  
*Goa, India*

*December 2006*

*Centre for High Energy Physics, Indian Institute of Science*  
*Bangalore KA India*

*December 2006*

*Indian Strings Meeting 2006 (international conference)*  
*Puri OD India*

*December 2006*

*Saha Institute of Nuclear Physics*  
*Kolkata WB India*

*December 2006*

## **A Universal Sector of Field/String Configurations in pp-Waves**

*Purdue University  
West Lafayette IN USA*

*October 2006*

*CERN Theory Division  
Meyrin, Geneva, Switzerland*

*June 2006*

## **Tachyon Condensation and Non-BPS D-Branes in a Ramond-Ramond Plane Wave Background**

*University of Kentucky  
Lexington KY USA*

*March 2006*

*Enrico Fermi Institute, University of Chicago  
Chicago IL USA*

*March 2006*

*C. N. Yang Institute for Theoretical Physics, Stony Brook University  
Stony Brook NY USA*

*March 2006*

*Great Lakes Strings Conference  
University of Michigan  
Ann Arbor MI USA*

*March 2006*

## **Non-BPS D-Branes in Light-Cone Green-Schwarz Formalism**

*University of Southern California  
Los Angeles CA USA*

*March 2005*

*University of California, Los Angeles  
Los Angeles CA USA*

*March 2005*

*California Institute of Technology  
Pasadena CA USA*

*March 2005*

## **On the Problem of Particle Production in $c=1$ Matrix Model**

*DAMTP, University of Cambridge  
Cambridge, UK*

*July 2004*

## **Rolling Tachyon with Electric Field and Fundamental Strings**

*The Michigan Center for Theoretical Physics, University of Michigan  
Ann Arbor MI USA*

*September 2003*

## **Decay of Unstable D-Branes with Electric Field**

*Indian Strings Meeting 2002 (international conference)  
Harish-Chandra Research Institute  
Prayagraj UP India*

*December 2002*



## **D-Branes in Vacuum String Field Theory**

*University of Kentucky  
Lexington KY USA*

*January 2002*

*Ohio State University  
Columbus OH USA*

*January 2002*

*Pennsylvania State University  
University Park PA USA*

*November 2001*

## **Unstable Non-BPS D-branes of Type II String Theories in Light-Cone Green-Schwarz Formalism**

*Kavli Institute for Theoretical Physics, UCSB (students' journal club presentation)  
Santa Barbara CA USA*

*June 2001*

*International Centre for Theoretical Physics  
Trieste, Italy*

*April 2001*

*Indian Institute of Technology, Kharagpur  
Kharagpur WB India*

*December 2000*