

# Runhong Zong

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**Research interests** Algebraic Geometry, Arithmetic Geometry, Mathematical Physics, Application of Mathematics to Philosophy and Economics

**Employment** **Nanjing Univeristy** Nanjing, China  
Professor, Department of Mathematics July 2019 – present

**Johannes Gutenberg University Mainz** Mainz, Germany  
Postdoc, Department of Mathematics May 2017 – June 2019  
Mentor: Professor Kang Zuo

**University California, Los Angeles** Los Angeles, USA  
Assistant Adjunct Professor, Dept. of Mathematics August 2015 – May 2017

**Institute for Advanced Study** Princeton, USA  
Member, School of Mathematics September 2014 – August 2015

**Education** **Univeristy of Pennsylvania** Pennsylvania, USA  
M.A. in Economics September 2015 – August 2018

**Princeton University** Princeton, USA  
Ph.D. in Mathematics September 2010 – November 2014  
Mentor: Professor János Kollár

**University of Science and Technology of China** Hefei, China  
B.S. in Mathematics and Applied Mathemtaics September 2006 – June 2010  
Summa Cum Laude. Overall GPA: 4.19/4.30, Major GPA: 4.30/4.30

**Publications**  **$U(1)$ -Gauge Theories on  $G_2$ -Manifolds**  
Zhi Hu, Runhong Zong  
to appear in *Annales Henri Poincaré*

**Weak Approximation for Fano Complete Intersections in Positive Characteristic**  
Jason Starr, Zhiyu Tian, Runhong Zong  
*Annales de l'Institut Fourier*, Vol. 72, No. 4, pp. 1503-1534 (2022)

### **Hyperbolic Superspaces and Super-Riemann Surfaces**

Zhi Hu, Runhong Zong

*Communications in Mathematical Physics*, Vol. 378, pp. 891-915 (2020)

### **Weak Approximation for Iso-trivial Families**

Zhiyu Tian, Runhong Zong

*Journal für die Reine und Angewandte Mathematik*, Vol. 752, pp. 1-23 (2019)

### **A Geometric Characterisation of Toric Varieties**

James McKernan, Roberto Svaldi, Morgan Brown, Runhong Zong

*Duke Mathematical Journal*, Vol. 167, Issue 5, pp. 923-968 (2018)

### **Curve Classes on Rationally Connected Varieties**

Runhong Zong

*“Rational Points, Rational Curves, and Entire Holomorphic Curves on Projective Varieties”–Contemporary Mathematics Series by American Mathematical Society*, Vol. 654 (2015)

### **On Rational Connectedness of Globally F-Regular Threefolds**

Yoshinori Gongyo, Zhiyuan Li, Hiromu Tanaka, Karl Schwede, Zsolt Patakfalvi, Runhong Zong

*Advances in Mathematics*, Vol. 280, pp. 47-78 (2015)

### **On the Space of Conics on Complete Intersections**

Runhong Zong

*Communications in Mathematics and Statistics*, Vol. 2, pp. 33-45 (2014)

### **One Cycles on Rationally Connected Varieties**

Zhiyu Tian, Runhong Zong

*Compositio Mathematica*, Vol. 150, Issue 03, pp. 396-408 (2012)

Preprints

### **A Materialistic System Theory with Method of Ideological Analysis in Materialistic dialectics**

Runhong Zong

### **Universal Constants, Law of Inertia and Emergent Geometry**

Zhi Hu, Mulin Yan, Runhong Zong

*arXiv:2303.02556* (2023)

### **Topological Structures of Moduli Spaces of Curves and Anabelian Geometry in Positive Characteristic**

Zhi Hu, Yu Yang, Runhong Zong

*arXiv:2301.04864* (2023)

**Moduli Spaces of Parabolic Bundles over  $P^1$  with Five Marked Points**

Zhi Hu, Pengfei Huang, Runhong Zong

*arXiv:2108.08994 (2021)*

**Generalized Deligne-Hitchin Twistor Spaces: Construction and Properties**

Zhi Hu, Pengfei Huang, Runhong Zong

*arXiv:2010.06893 (2020)*

**On Base Changes of Local Stability in Positive Characteristics**

Zhi Hu, Runhong Zong

*arXiv:2001.04083 (2020)*

**Socialist Political Economy with Chinese Characteristics: the Grand Unified Theory of Philosophy and Social Science**

Runhong Zong

*In Submission (This is a Chinese monograph on philosophy and political economy of roughly 1,000,000 Chinese words, in which strong mathematical methods are applied)*

**The Philosophical Foundation of New Economic System: An Ontology Characterising the Operation of the Universe in Materialistic Dialectics**

Runhong Zong

*Submitted for Publication (This is a Chinese monograph on philosophy of roughly 400,000 Chinese words, in which strong mathematical methods are applied)*

**Towards Socialist Political Economy with Chinese Characteristics**

Runhong Zong

*To be Published by Synergy Publishing Pte. Ltd. (This is a Chinese monograph on philosophy and political economy of roughly 320,000 Chinese words, in which strong mathematical methods are applied)*

**Introduction to New Economics System**

Runhong Zong

*To be Published by Xinhua Publishing House (This is a Chinese monograph on economics of roughly 330,000 Chinese words, in which strong mathematical methods are applied)*

**A Study of New Economics System: Integration and Unification of Sharing Economy and Competitive Economy**

Runhong Zong

*To be Published by Xinhua Publishing House (This is a Chinese monograph on economics of roughly 590,000 Chinese words, in which strong mathematical methods are applied)*

## Invited Talks

### **Topological Structures of Moduli Spaces of Curves and Anabelian Geometry in Positive Characteristic**

*45 minutes talk at the International Congress of Chinese Mathematicians (ICCM 2023), 1/4/2024)*

### **On Base Change of Local Stability in Positive Characteristics**

*Algebraic Geometry and Arithmetic Geometry Conference, University of Science and Technology of China, 9/28/2019*

### **Finding Rational Curves by Forgetful Maps**

*Chern Institute of Mathematics, Nankai University, 8/5/2018*

### **Finding Rational Curves by Forgetful Maps**

*Department of Mathematics, Nanjing University, 7/15/2018*

### **Finding Rational Curves by Forgetful Maps**

*School of Mathematical Science, Wuhan University, 6/5/2018*

### **Finding Rational Curves by Forgetful Maps**

*School of Mathematical Science, Tongji University, 2/5/2018*

### **Finding Rational Curves by Forgetful Maps**

*Postdoctoral Member Talk, Institute for Advanced Study, 10/01/2014*

### **A New Look at the Graber-Harris-Starr Theorem**

*Conference—"Algebraic-Geometry-Seattle-2014", University of Washington Seattle, 08/04/2014*

### **On Density of Rational Points in the Adèles of Function Field of Curves**

*Number Theory Seminar, University of Berkeley, 10/30/2013*

### **Weak Approximation for Isotrivial Families**

*Algebraic Geometry Seminar, University of Utah, 10/29/2013*

### **Some New Results in the Topic of Rationally Connected Varieties**

*The Algebraic and Arithmetic Geometry Conference to "AGAG Summer School 2013", University of Science and Technology of China, 8/27/2013*

### **Weak Approximation for Isotrivial Families**

*Algebraic Geometry Seminar, Stanford University, 2/28/2013*

### **One Cycles on Rationally Connected Varieties**

*Algebraic Geometry Seminar, California Institute of Technology, 11/19/2012*

# **One Cycles on Rationally Connected Varieties**

*Algebraic Geometry Preprint Seminar, University of Utah, 10/26/2012*