

# Ved V. Datar

## Curriculum Vitae

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### CONTACT AND PERSONAL INFORMATION

- **Address.** Dept. Of Math., Indian Institute of Science (IISc), Bangalore, KA - 560012, India
- **Email Address.** vvdatar@iisc.ac.in
- **Webpage.** [www.math.iisc.ac.in/~vvdatar](http://www.math.iisc.ac.in/~vvdatar)

### RESEARCH INTERESTS

- Geometric Analysis
- Complex differential geometry

### EMPLOYE-MENT

- *Associate Professor* October 2024 - Present  
Indian Institute of Science (IISc), Bangalore, India
- *Assistant Professor* September 2018 - September 2024  
Indian Institute of Science (IISc), Bangalore, India
- *Summer Lecturer* June 2018 - August 2018  
UC Berkeley, Berkeley, USA
- *RTG postdoc* July 2015 - June 2018  
UC Berkeley, Berkeley, USA
- *Visiting Instructor* August 2014 - May 2015  
University of Notre Dame, Notre Dame, USA
- *Teaching Assistant and Graduate student* Fall 2008-July 2014  
Rutgers, The State University of New Jersey, New Brunswick, USA

### EDUCATION

- *Ph.D.*, Mathematics, May 2014  
Rutgers, The State University of New Jersey, New Brunswick, NJ  
**Advisor.** Jian Song  
**Thesis title.** *Canonical Kähler metrics with cone singularities*  
<https://rucore.libraries.rutgers.edu/rutgers-lib/44071/>
- *Bachelor of Science (Honors)*, Mathematics and Computer Science, August 2008  
Chennai Mathematical Institute, India.

### RESEARCH PUBLICATIONS AND PREPRINTS (in the order they appeared on arXiv)

13. *Minimal slopes and bubbling for complex Hessian equations* (with Ramesh Mete and Jian Song), preprint: <https://arxiv.org/abs/2312.03370>.
12. *Diameter rigidity for Kahler manifolds with positive bisectional curvature* (with Harish Seshadri), MATH. ANN. (2022), <https://link.springer.com/article/10.1007/s00208-021-02355-8>.
11. *Kähler-Einstein metric near an isolated log canonical singularity* (with Xin Fu and Jian Song), JOURNAL FÜR DIE REINE UND ANGEWANDTE MATHEMATIK (Crelles Journal), **797** (2023), 79–116.
10. *Metric rigidity of Kahler manifolds with lower Ricci bounds and almost maximal volume* (with Harish Seshadri and Jian Song), PROC. OF THE AMS, **149** (2021), no. 8, 3569–3574.

9. *A numerical criterion for generalised Monge-Ampere equations on projective manifolds* (with Vamsi Pingali), *GEOM. FUNC. ANAL. (GAFA)*, **31** (2021), no. 4, 767–814.
8. *On coupled constant scalar curvature Kähler metrics* (with Vamsi Pingali), *J. SYMPLECTIC GEOM.*, **18** (2020), no. 4, 961–994.
7. *Adiabatic limits of anti-self-dual connections on collapsed K3 surfaces* (with Adam Jacob and Yuguang Zhang), *J. DIFFERENTIAL GEOM.* **118** (2021) 223–296.
6. *Hermitian-Yang-Mills connections on collapsing elliptically fibered K3 surfaces* (with Adam Jacob), *J. GEOM. ANAL.* **32** (2022), <https://link.springer.com/article/10.1007/s12220-021-00808-9>.
5. *Expansions of solutions to extremal metric type equations on blow-ups of cscK surfaces*, *ANN. GLOBAL ANAL. GEOM.* **55** (2019), no. 2, 215–241.
4. *Kähler-Einstein metrics along the smooth continuity method* (with Gábor Székelyhidi), *GEOM. FUNCT. ANAL. (GAFA)* **26** (2016), no. 4, 975–1010.
3. *On convexity of the regular set of conical Kähler-Einstein metrics*, *MATH. RES. LETT.* **23** (2016), no. 1, 105–126.
2. *A remark on Kähler metrics with conical singularities along a simple normal crossing divisor* (with Jian Song), *BULL. LOND. MATH. SOC.* **47** (2015), no. 6, 1010–1013.
1. *Connecting toric manifolds by conical Kähler-Einstein metrics* (with Bin Guo, Jian Song and Xiaowei Wang), *ADV. MATH.* **323** (2018), 38–83.

#### OTHER PUBLICATIONS

1. *An overview of the work of Karen Uhlenbeck* (with Agnid Banerjee), *THE MATHEMATICS CONSORTIUM BULLETIN*, July 2020 Vol. 2, Issue 1.

#### AWARDS

- Young Associate of the Indian National Science Academy (INSA) 2024
- Infosys Young Investigator Award August 2019-July 2021
- AMS travel award for attending Joint Mathematics Meetings November 2013
- SAS Excellence Fellowship for dissertation work in Mathematics Fall 2013  
School of Arts and Sciences (SAS), Rutgers University
- TA Teaching Excellence Award, Spring 2012  
Department of Mathematics, Rutgers University
- Scholarship from National Board for Higher Mathematics (NBHM), 2005-2008
- Selected for the International Math Olympiad training Camp (IMOTC), 2005  
Based on performance in the Indian National Mathematics Olympiad

#### SERVICE

- Referee for *Annales de l'Institut Fourier*, *American Journal of Mathematics*, *Journal of Geometric Analysis*, *Mathematical Research Letters*, *Journal of Differential Geometry*, *Geometry and Topology*, *Transactions of the AMS* and *Proceedings of the Indian academy of Sciences*.
- Organiser for the IISc Geometry and Topology seminar (Aug 2019-Dec 2021), and co-organiser (with Vamsi Pingali) of the IISc informal geometric analysis seminar.
- ATM schools - AIS in *Riemannian Geometry* (July 2019) and *Geometric Analysis* (Dec, 2019), ATM-IST in *Geometry of Complex functions* (July 2021).
- Organised the UC Berkeley Differential geometry seminar in Fall 2016 and Spring 2018.

- Co-organized (with Richard Bamler) the student differential geometry seminar at Berkeley in Spring 2017.

## MENTORING

- PhD Students:
  - Sivaram P - graduated in 2024, currently a postdoc at Aarhus University, Denmark
  - Ramesh Mete - graduated in 2024, currently a post-doc at IIT-B.
  - Rajas Sompurkar (jointly with Vamsi Pingali), graduated in 2024.
- UG/MSc Students - Mohith Raju (MSc Project, 2023-24), Adithya Upadhya (UG Project, Jan 2021), Vasanth P (MSc Project, 2020-21), Saurav Ghosh (CMI, MSc Project, August 2019).
- Summer projects - Gobinda Debnath (NIT Agartala, 2019).

## CONFERENCE or SYMPOSIUM TALKS

- *Minimal slopes and singular solutions for complex Hessian equations*, May 2024  
Conference on ‘K-stability and moment maps’, Isaac Newton Institute, Cambridge, UK
- *Diameter rigidity for Kahler manifolds with positive bi-sectional curvature*, Dec. 2023  
Symposia Talk, Geometry and Topology Session, RMS Annual Meeting, IIT Guwahati
- *Non-linear PDEs on Kähler manifolds and positivity conditions*, Dec. 2023  
Symposia Talk, Partial Differential Equations Session, RMS Annual Meeting, IIT Guwahati
- *Slope conditions for some complex Hessian equations*, Dec. 2022  
NSMA, Ramanujan’s birthday celebrations, IIT-M.
- *Non-linear PDEs and positivity conditions in algebraic geometry*, Sept. 2021  
IISc-IISER-Pune mathematics symposium.
- *Moment maps and canonical metrics in complex geometry*, July 2020  
Virtual Math Fest.
- *Adiabatic limits of ASD connections on collapsed K3 surfaces*, Mar. 2019  
International conference on Algebraic and Analytic Geometry, Kerala School of Mathematics (KSOM).
- *Constant scalar curvature metrics on blow-ups of Kähler surfaces*, Nov. 2017  
AMS Special session on Geometric Analysis, Fall Western sectional meeting, UC Riverside.
- *Extremal metrics on blow-ups*, Jul. 2017  
Trends In Modern Geometry 2017, Tokyo, Japan.
- *Kähler-Einstein metrics along the smooth continuity method*, Jun. 2016  
Recent advances in complex differential geometry, Toulouse, France.
- *Kähler-Einstein metrics along the smooth continuity method*, Jun. 2015  
Jagiellonian University, Krakow, Poland.
- *Conical soliton metrics on Kähler manifolds*, Mar. 2014  
Special Session on Interaction between Complex and Geometric Analysis, Spring Eastern Sectional Meeting of the AMS, Maryland.
- *Conical soliton metrics on Kähler manifolds*, Jan. 2014  
Special Session on Recent Progress in Geometric and Complex Analysis, Joint Mathematics Meetings of AMS, Maryland.

**SELECTED  
OTHER TALKS**

- *Connectedness of the space of singular KE metrics on toric varieties*, Apr. 2013  
Graduate Student Topology and Geometry Conference, Notre Dame.
- *Minimal slopes and singular solutions to some complex Hessian equations*, Dec 2023  
TIFR, Mumbai.
- *Diameter rigidity for Kahler manifolds with positive bi-sectional curvature*, Dec. 2023  
Seminar talk, IISER-Pune.
- *Minimal slopes and singular solutions to some fully non-linear PDEs on Kähler manifolds*, Jul. 2023  
Seminar talk, IISER-Pune.
- *Slope Conditions for Some Complex Hessian Equations*, Mar. 2022  
BICMR, Peking (online).
- *Some new rigidity results in complex geometry*, Mar. 2022  
CUHK, Hong Kong (online).
- *Some new rigidity results in Kahler geometry*, Feb. 2022  
Seminar semiklassische Analysis und Darstellungstheorie, Koln (online).
- *Some new rigidity results in Kähler geometry*, Jan. 2022  
Lefschetz Seminar, Clark University (online).
- *Some rigidity theorems in Kahler geometry*, Nov. 2021  
Oberseminar Differentialgeometrie, Munster (online).
- *Nakai type criteria for solving certain general inverse Hessian type equations on projective manifolds*, Oct. 2020  
Differential Geometry Seminar, UC Berkeley (online).
- *(Inverse)-Hessian type equations and positivity in complex algebraic geometry*, June 2020  
CMI Online Seminar Series.
- *Hermitian-Yang-Mills connections on collapsing K3 surfaces*, May 2018  
Southern California Differential Geometry Seminar,  
UC Riverside.
- *Constant scalar curvature metrics on blow-ups of Kähler surfaces*, Oct. 2017  
Geometry/Topology Seminar, UC Davis
- *Constant scalar curvature metrics on blow-ups of Kähler surfaces*, Sept. 2017  
Differential geometry seminar, UC Berkeley
- *Kähler-Einstein metrics on Fano manifolds*, Jan. 2016  
Geometry/Topology Seminar, UC Davis
- *Kähler-Einstein metrics along the smooth continuity method*, Dec. 2015  
Bay Area Differential Geometry Seminar, MSRI, Berkeley
- *Kähler-Einstein metrics along the smooth continuity method.*, Nov. 2015  
Geometry and Analysis seminar, UC Santa Cruz
- *Kähler-Einstein metrics along the smooth continuity method.*, Sept. 2015  
Differential geometry seminar, UC Berkeley
- *Kähler-einstein metrics along the smooth continuity method*, Jul. 2015  
Chennai Mathematical Institute, Chennai, India
- *Connecting toric manifolds by conical KE metrics*, Apr. 2015  
JHU-UMD Complex geometry seminar, Johns Hopkins
- *Convexity of regular set of singular KE metrics*, Nov. 2014  
Analysis Seminar, Northwestern University

**COURSES  
TAUGHT**

- *Conical soliton metrics on Kähler manifolds,* Sept. 2013  
Complex Analysis and Geometry Seminar, Rutgers University

**Indian Institute of Science.**

- *Introduction to Differentiable manifolds* Jan. 2025
- *Riemann Surfaces* Aug. 2024
- *Riemannian Geometry* Aug. 2019  
Aug. 2021  
Aug. 2023
- *Complex Analysis* Jan. 2020  
Jan. 2024
- *Topics in Riemannian Geometry: Cheeger-Colding-Naber theory* Aug. 2020
- *Calculus on manifolds* Jan. 2021
- *UM-102: Analysis and Linear Algebra - II* Jan. 2023

**UC Berkeley.**

- *Honors single variable calculus 1B* Fall 2015
- *Honors Multivariable Calculus* Fall 2015  
Spring 2018
- *Real Analysis* Spring 2017  
Fall 2017  
Summer 2018
- *Complex Analysis* Fall 2016

**University of Notre Dame.**

- *Calculus-2 and Linear algebra and differential equations* Spring 2015
- *Calculus-1 and Calculus-3* Fall 2014

**Rutgers University as Instructor.**

- *Advanced Calculus for Engineering* Summer 2014
- *Mathematical Theory of Probability* Summer 2011

**Rutgers University as TA.**

- *Differential Equations for Engineering and Physics* Fall 2011 - Spring 2014
- *Calculus-2 for the Mathematical and Physical Sciences* Spring 2010  
Fall 2009
- *Calculus-1 for the Mathematical and Physical Sciences* Fall 2010