

## Soumyashant Nayak

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<b>Postdoctoral Affiliation</b>	<i>Postdoctoral Researcher in Bioinformatics</i> at ITMAT, Smilow Center for Translational Research in the <b>Perelman School of Medicine, University of Pennsylvania</b> . (September 2016 - present) Mentored by <b>Gregory Grant</b> .
<b>Education</b>	<i>Philosophiae Doctorate in Mathematics</i> , awarded by the <b>University of Pennsylvania</b> , Philadelphia in August 2016. Thesis - <i>On the Diagonals of Projections in Matrix Algebras over von Neumann Algebras</i> Advisor - <b>Richard V. Kadison</b>  <i>Bachelor of Mathematics (Hons.)</i> , Mathematics (2008-2011) <b>Indian Statistical Institute</b> , Bangalore Centre
<b>Research Interests</b>	Operator Algebras, Representation Theory, Statistical Methods in Bioinformatics, Systems Biology
<b>Awards and Honors</b>	<ul style="list-style-type: none"><li>• Benjamin Franklin Fellowship - University of Pennsylvania, 2011 - 2016.</li><li>• KVPY fellowship , Dept. of Science and Technology, Govt. of India, 2006-2011</li><li>• Selected for the Summer Research Fellowship Programme (SRFP) for 2 consecutive years, 2010-2011 by Indian Academy of Sciences</li><li>• Selected among top 30 students in India in the Indian National Mathematical Olympiad (INMO) for 3 consecutive years, 2006-2008</li><li>• Gold Medal in International Olympiad on Astronomy and Astrophysics (IOAA) 2007 held at Chiang Mai, Thailand</li><li>• Bronze Medal in International Astronomy Olympiad (IAO) 2006 held at Mumbai, India</li><li>• Silver Medal in International Astronomy Olympiad (IAO) 2005 held at Beijing, China</li><li>• NTSE scholarship, NCERT, 2006 (declined).</li><li>• Placed among top 1% in National Standard Examination in Physics 2007</li></ul>
<b>Publications and Preprints</b>	<i>Mathematics :</i> <ol style="list-style-type: none"><li>1. <b>S. Nayak</b>; <i>The Hadamard Determinant Inequality - Extensions to Operators on a Hilbert Space</i>, J. Funct. Anal., Vol. 274, Issue 10 (May 2018), pp 2978–3002. [DOI:10.1016/j.jfa.2017.10.009], [arXiv:1704.05421]</li><li>2. M. Gaál, <b>S. Nayak</b>; <i>On a class of determinant preserving maps for finite von Neumann algebras</i>, J. Math. Anal. Appl. (accepted - April 2018). [DOI:10.1016/j.jmaa.2018.04.006] [arXiv:1711.08786]</li><li>3. <b>S. Nayak</b>; <i>The Douglas Lemma for von Neumann Algebras and Some Applications</i> (submitted, 16 pp). [arXiv:1707.04378]</li></ol>

4. **S. Nayak**; *On a New Ring Invariant - Towards a Framework for Rank Identities* (submitted, 32 pp).  
[arXiv:1801.08072]
5. **S. Nayak**; *Jensen's Inequality in Finite Subdiagonal Algebras* (submitted, 10 pp).  
[arXiv:1807.11652]

*Bioinformatics :*

1. Arjun Sengupta, Seth D Rhoades, Eun Ji Kim, **Soumyashant Nayak**, Gregory R Grant, Peter Meerlo, Aalim M Weljie; *Sleep restriction induced energy, methylation and lipogenesis metabolic switches in rat liver*, The International Journal of Biochemistry and Cell Biology, Vol. 93 (2017), 129-135 pp.  
[DOI:10.1016/j.biocel.2017.08.014]
2. Preetika Gupta, Ogul E Uner, **Soumyashant Nayak**, Gregory R Grant, Robert G Kalb; *SAP97 regulates behavior and expression of schizophrenia risk enriched gene sets in mouse hippocampus*, PLoS ONE 13(7): e0200477.  
[DOI:10.1371/journal.pone.0200477]
3. **Soumyashant Nayak**, Nicholas Lahens, Eun Ji Kim, Emanuela Ricciotti, George Paschos, Sarah Tiskoff, Dimitra Sarantopoulou, Shaon Sengupta, Barry Cooperman, Tilo Grosser, Gregory Grant; *Iso-relevance Functions - A Systematic Approach to Ranking Genomic Features by Differential Effect Size*.  
[bioRxiv:doi:10.1101/381814 ]

**Teaching  
Experience**

*Instructor, University of Pennsylvania*

- Math 241, Calculus IV, Introduction to Partial Differential Equations (Summer Session II, 2016)
- Math 170, Ideas in Mathematics (Full Summer Session 2016)
- Official Math Help Tutor, All Undergraduate Courses (Summer Session II, 2015)
- Math 114, Introduction to Multivariable Calculus (Summer Session II, 2013)

*Teaching Assistant, University of Pennsylvania*

- Math 608, Complex Analysis, Fall 2014
- Math 509, Advanced Analysis, Spring 2014
- Math 180, Analytical Methods in Economics, Law and Medicine, Fall 2013
- Math 425, Partial Differential Equations, Spring 2013
- Math 312, Linear Algebra, Fall 2012

**Conferences  
Attended**

- Conference on Intelligent Systems for Molecular Biology (ISMB) - 2018 at Hyatt Regency, Chicago. 6-10 July, 2018.
- Pacific Symposium for Biocomputing - 2018 at Fairmont Orchid, the Big Island of Hawaii. 3-7 Jan, 2018.
- ITMAT 2017 Symposium : Structures, Technologies and Discoveries in Translational Science at Smilow Research Center, University of Pennsylvania, Philadelphia. 16-17 October, 2017.
- AMS Fall Southeastern Sectional Meeting, University of Central Florida, Orlando. 23-24 September, 2017.
- COSy - 2017 at Lakehead University. 29 May - 1 June, 2017.

- Penn Symposium on Mathematical and Computational Biology at University of Pennsylvania, Philadelphia. 22-23 May, 2017.
- Noncommutative Geometry and Operator Algebras (NCGOA) Spring Institute at University of Bonn. 17-25 May, 2016.
- CBMS conference at University of Wyoming, Laramie. 8-12 June, 2015.
- RMMC Summer School at University of Wyoming, Laramie. 1-5 June, 2015.
- Great Plains Operator Theory Symposium (GPOTS) - 2015 at Purdue University, West Lafayette. 26-30 May, 2015.
- Classification Of  $C^*$ -Algebras, Flow Equivalence of Shift Spaces, And Graph and Leavitt Path Algebras at University of Louisiana, Lafayette. 11-15 May, 2015.
- Lecture Series on Quantum Groups by Dr. Moritz Weber at the Institute of Mathematical Sciences, Chennai. 5-24 Jan, 2015.
- 2013 CNA Summer School: Topics in Nonlinear PDEs and Calculus of Variations, and Applications in Materials Science, at CMU, Pittsburgh. 29 May - 7 June, 2013.
- NCGOA - 2013 at Vanderbilt University, Nashville. 3-9 May, 2013.
- Riviere-Fabes Symposium at University of Minnesota, Twin Cities. 19-21 April, 2013.
- 3rd Ohio River Analysis Meeting at University of Cincinnati. 9-10 March, 2013.

## Talks

### *Conference Talks*

- *AMS Fall Southeastern Sectional Meeting* (23 September, 2017), University of Central Florida, Orlando.
- *Canadian Operator Algebras Symposium* (30 May, 2017), Lakehead University, Thunder Bay.
- *RMMC Summer School* (2 June, 2015), University of Wyoming, Laramie.
- *Great Plains Operator Theory Symposium* (27 May, 2015), Purdue University, West Lafayette.

### *Colloquia and Seminar Talks*

- *SOPM - 2017* (24 June, 2017) NISER, Jatni, Bhubaneswar.
- *Analysis Seminar* (14 April, 2017) Drexel University, Philadelphia.