

# Ashwin Jha

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**Office:** CISP – Helmholtz Center for Information Security  
Kaiserstraße 170-174, 66386 St. Ingbert, Germany

**Web:** [ashwin-jha.github.io](https://ashwin-jha.github.io)

**Email:** [letterstoashwin@gmail.com](mailto:letterstoashwin@gmail.com)

**Phone:** +49 681 87083 2218

**Research Interests** My research interests are primarily in symmetric-key cryptography, with a special focus on the *design and analysis of symmetric-key modes of operation*.

**Current Position** **Postdoctoral Researcher** January, 2021 – present  
CISP – Helmholtz Center for Information Security Saarbrücken, Germany  
Host: Dr. Benoît Cogliati

**Education** **Doctor of Philosophy in Computer Science** July, 2015 – June, 2020  
Indian Statistical Institute Kolkata, India  
Dissertation: Provable Security of Symmetric-key Cryptographic Schemes  
Advisor: Prof. Mridul Nandi

**Master of Technology in Computer Science** July 2013 – July 2015  
Indian Statistical Institute Kolkata, India  
Dissertation: Cryptanalysis of Iterated Hash and Its Variants  
First class *with Honours* (Aggregate: 78%), *Best Dissertation Award*  
Advisor: Prof. Mridul Nandi

**Bachelor of Engineering in Computer** August 2008 – June 2012  
Delhi College of Engineering, University of Delhi Delhi, India  
First class (Aggregate: 67%)

**Research Experience** **Postdoctoral Researcher** January, 2021 – present  
CISP – Helmholtz Center for Information Security Saarbrücken, Germany  
Working on the design and analysis of symmetric-key modes of operations.

**Visiting Scientist** July 2020 – December 2020  
R. C. Bose Centre for Cryptology and Security, Kolkata, India  
Indian Statistical Institute  
Worked on the design and analysis of lightweight authenticated encryption mode.

**Research Intern** January 2018 – March 2018  
Fujitsu Laboratories of America Sunnyvale, USA  
Worked on the cryptanalysis of pseudorandom functions using quantum query access.

**Research Intern** August 2017 – October 2017  
NTT Secure Platform Laboratories Tokyo, Japan  
Worked on the provable security of tweakable block cipher based modes of operation.

**Research Fellow** July 2015 – June 2020  
Applied Statistics Unit, Indian Statistical Institute Kolkata, India  
Worked on the provable security analysis of symmetric-key modes of operations.

## Publications\*

- B. Cogliati, A. Jha and M. Nandi: *How to Build Optimally Secure PRFs Using Block Ciphers*. IACR ASIACRYPT 2020(Part I):754–784, 2020.
- A. Jha and M. Nandi: *Tight Security of Cascaded LRW2*. J. Cryptology 33(3): 1272–1317, 2020.
- B. Chakraborty, A. Jha and M. Nandi: *On the Security of Sponge-type Authenticated Encryption Modes*. IACR Trans. Symmetric Cryptol. 2020(2): 93–119, 2020.
- A. Chakraborti, N. Datta, A. Jha, S. Mitragotri and M. Nandi: *From Combined to Hybrid: Making Feedback-based AE even Smaller*. IACR Trans. Symmetric Cryptol. 2020(S1): 417–445, 2020.
- A. Chakraborti, N. Datta, A. Jha, C. Mancillas-López, M. Nandi and Y. Sasaki: *ESTATE: A Lightweight and Low Energy Authenticated Encryption Mode*. IACR Trans. Symmetric Cryptol. 2020(S1): 350–389, 2020.
- A. Chakraborti, N. Datta, A. Jha, C. Mancillas-López, M. Nandi and Y. Sasaki: *INT-RUP Secure Lightweight Parallel AE Modes*. IACR Trans. Symmetric Cryptol. 2019(4): 81–118, 2019.
- A. Jha, C. Mancillas-López, M. Nandi and S. Sen Gupta: *On Random Read Access in OCB*. IEEE Trans. Information Theory 65(12): 8325–8344, 2019.
- A. Jha and M. Nandi: *On Rate-1 and Beyond-the-Birthday Bound Secure Online Ciphers using Tweakable Block Ciphers*. Cryptography and Communications 10(5): 731–753, 2018.
- A. Jha, E. List, K. Minematsu, S. Mishra and M. Nandi: *XHX - A Framework for Optimally Secure Tweakable Block Ciphers from Classical Block Ciphers and Universal Hashing*. LATINCRYPT 2017: 207–227, 2017.
- A. Dutta, A. Jha and M. Nandi: *A New Look at Counters: Don't Run Like Marathon in a Hundred Meter Race*. IEEE Trans. Computers 66(11): 1851–1864, 2017.
- A. Dutta, A. Jha and M. Nandi: *Tight Security Analysis of EHtM MAC*. IACR Trans. Symmetric Cryptol. 2017(3): 130–150, 2017.
- A. Jha, A. Mandal and M. Nandi: *On The Exact Security of Message Authentication Using Pseudorandom Functions*. IACR Trans. Symmetric Cryptol. 2017(1): 427–448, 2017.
- A. Jha and M. Nandi: *Revisiting Structure Graphs: Applications to CBC-MAC and EMAC*. J. Mathematical Cryptology. 10(3–4): 157–180, 2016.

\* A more comprehensive list is available on [DBLP](#).

## Talks and Tutorials

- How to Build Optimally Secure PRFs Using Block Ciphers*  
IACR ASIACRYPT 2020 (held in online mode)
- On the Security of Sponge-type Authenticated Encryption Modes*  
IACR FSE 2020 (held in online mode)

	<i>From Combined to Hybrid: Making Feedback-based AE even Smaller</i> IACR FSE 2020 (held in online mode)	
	<i>ESTATE: A Lightweight and Low Energy Authenticated Encryption Mode</i> IACR FSE 2020 (held in online mode)	
	<i>Towards an Improved Bound on CBC Collision Probability and Its Applications</i> India Crypto Meet 2020 (held in online mode)	
	<i>Hash Functions and Message Authentication Codes</i> ISI Summer Internship in Cryptology 2018	Kolkata, India
	<i>On The Exact Security of Message Authentication Using Pseudorandom Functions</i> FSE 2017	Tokyo, Japan
	<i>A New Look at Counters: Don't Run Like Marathon in a Hundred Meter Race</i> DIAC 2016	Nagoya, Japan
Teaching Experience	<b>Co-instructor</b> Advanced Cryptology [M. Tech. (CrS) III] Indian Statistical Institute Kolkata, India	Autumn 2020
	<b>Co-instructor</b> Cryptology [M. Tech. (CS) III] Indian Statistical Institute, Kolkata, India	Autumn 2018
	<b>Teaching Assistant</b> Computing Systems I [M. Tech. (CrS) I] Indian Statistical Institute, Kolkata, India	Autumn 2018
	<b>Teaching Assistant</b> Data and File Structures Lab. [M. Tech. (CS) I] Indian Statistical Institute, Kolkata, India	Autumn 2015
Reviewing Activities	<i>Journal Reviews:</i> Springer DCC, IET Information Security, IEICE Transactions, The Computer Journal <i>External Reviewing:</i> CRYPTO, EUROCRYPT, ASIACRYPT, FSE, INDOCRYPT, CANS, IEEE IT	
Industry Experience	<b>Google Summer of Code 2014 Intern</b> April 2014 – August 2017 <i>Eclipse Foundation</i> Developed a centralized logging framework for the Eclipse IDE platform.	
	<b>Software Engineer</b> June 2012 – July 2013 <i>Algoworks Technologies</i> Worked in the Android applications development team.	Noida, India
	<b>Software Intern</b> May 2011 – July 2011 <i>ESQ Management Solutions Inc.</i> Built test cases for ATM and POS analytics.	Noida, India
Fellowships and Awards	Doctoral Research Fellowship (ISI Kolkata)	2015–2020
	Student Travel Grant (IACR)	FSE (2017, 2020)
	Suniti Kumar Pal Gold Medal (ISI Kolkata)	2015
	Google Summer of Code Fellowship (Google)	2014

## Skills

*Programming:* C, C++, Java

*Markup:*  $\text{\LaTeX}$ , HTML

*Languages:* English, Hindi, Maithili

## References

**Prof. Mridul Nandi**

Indian Statistical Institute

[mridul@isical.ac.in](mailto:mridul@isical.ac.in)

Kolkata, India

**Dr. Kan Yasuda**

NTT Secure Platform Laboratories

[yasuda.kan@lab.ntt.co.jp](mailto:yasuda.kan@lab.ntt.co.jp)

Tokyo, Japan

**Prof. Shay Gueron**

University of Haifa

[shay@math.haifa.ac.il](mailto:shay@math.haifa.ac.il)

Haifa, Israel

**Dr. Yu Sasaki**

NTT Secure Platform Laboratories

[sasaki.yu@lab.ntt.co.jp](mailto:sasaki.yu@lab.ntt.co.jp)

Tokyo, Japan

**Prof. Guruprasad Kar**

Indian Statistical Institute

[gkar@isical.ac.in](mailto:gkar@isical.ac.in)

Kolkata, India

**Dr. Arijit Bishnu**

Indian Statistical Institute

[arijit@isical.ac.in](mailto:arijit@isical.ac.in)

Kolkata, India