# Curriculum Vitae Professor Dr Muriel Médard

**Name:** **Muriel Médard**
**Date of birth:** **1 February 1968**

**Research Priorities: Network coding, information theory, wireless networks, optical networks**

Muriel Médard is an information theorist and electrical engineer. Her research interests cover the fields of network coding and reliable communication, especially for optical and wireless networks. Her work on Guessing Random Additive Noise Decoding (GRAND), a universal decoder, is considered a breakthrough in the research of different codes' behaviour and makes it possible to directly incorporate encryption into error-correcting code.

**Academic and Professional Career**

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| since 2022 | Professor, Software Science and Engineering, Electrical Engineering and Computer Science (EECS) Department, Massachusetts Institute of Technology (MIT), Cambridge, USA |
| 2014 - 2022 | Cecil H. Green Professor of Electrical Engineering and Computer Science, EECS Department, MIT, Cambridge, USA |
| 2008 | Professor, Electrical Engineering and Computer Science, EECS Department, MIT, Cambridge, USA |
| 2005 - 2008 | Tenured Associate Professor, Electrical Engineering and Computer Science, EECS Department, MIT, Cambridge, USA |
| 2003 - 2005 | Associate Professor without tenure, Electrical Engineering and Computer Science, EECS Department, MIT, Cambridge, USA |
| 2000 - 2003 | Assistant Professor, Electrical Engineering and Computer Science, EECS Department, MIT, Cambridge, USA |
| 1998 - 1999 | Assistant Professor, University of Illinois, Urbana-Champaign, USA |

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| 1995 - 1998 | Associate, Lincoln Laboratory, MIT, Cambridge, USA |
| 1995 | Doctor of Science in Electrical Engineering, MIT, Cambridge, USA |
| 1991 | Bachelor of Science in Humanities (Russian Studies), MIT, Cambridge, USA |
| 1991 | Master of Science in Electrical Engineering, MIT, Cambridge, USA |
| 1989 | Bachelor of Science in Mathematics, MIT, Cambridge, USA |
| 1989 | Bachelor of Science in Electrical Engineering and Computer Science, MIT, Cambridge, USA |

## Functions in Scientific Societies and Committees

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| since 2021 | Member, Board of Governors, Institute of Electrical and Electronics Engineers (IEEE) |
| since 2021 | Editor in Chief, IEEE Transactions on Information Theory |
| 2021 - 2022 | Peer Committee, National Academy of Engineering, USA |
| since 2020 | Member, Advisory Committee, Computer and Information Science and Engineering (CISE), National Science Foundation (NSF), USA |
| 2020 - 2021 | Inaugural Chair, Mildred Dreselhaus Medal Committee, IEEE |

## Project Coordination, Membership in Collaborative Research Projects

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| 2022 - 2025 | Principal Investigator, "RINGS: Coding over High-Frequency for Absolute Post-Quantum Security (CHAPS)", NSF, USA |
| 2021 - 2024 | Principal Investigator, "SWIFT:Facilitating Spectrum Access by Noise Guessing", NSF, USA |
| 2021 - 2022 | DARPA GRAND, Defense Advanced Projects Agency (DARPA), USA |
| 2020 - 2021 | MIT-IBM-Watson AI Lab, MIT, Cambridge, USA |

## Honours and Awarded Memberships

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| since 2022 | Member, German National Academy of Sciences Leopoldina, Germany |
| 2022 | Honorary Doctorate, Aalborg University, Aalborg, Denmark |
| 2022 | IEEE Koji Kobayashi Computers and Communications Award, IEEE |
| since 2021 | Member, American Academy of Arts and Sciences, USA |
| 2021 | Padovani Lecturer 2021, Information Theory Society, IEEE |
| since 2020 | Member, National Academy of Engineering, USA |

| 2020 | Honorary Doctorate, Technical University of Munich, Munich, Germany |
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| 2018 | Fellow, National Academy of Inventors, USA |
| 2017 | Aaron Wyner Distinguished Service Award, Information Theory Society, IEEE |
| 2016 | IEEE Vehicular Technology James Evans Avantgarde Award, Vehicular Technology Society, IEEE |

**Research priorities**

Muriel Médard is an information theorist and electrical engineer. Her research interests cover the fields of network coding and reliable communication, especially for optical and wireless networks. Her work on the Guessing Random Additive Noise Decoding (GRAND) algorithm, a universal decoder, is considered a breakthrough in the research of different codes' behaviour and makes it possible to directly incorporate encryption into error-correcting code.

Muriel Médard is considered a network pioneer and is increasingly interested in the development of decoders using GRAND. These decoders use knowledge about white noise statistics to their advantage, for example for incorporating network coding in network protocols and their use for the development of new security tools, especially for post-quantum cryptography.

With the algorithm developed by Murial Médard, it is possible to investigate the behaviour of various codes, from random linear codes to a cyclical redundancy check (CRC) and cryptographic processes such as encryption method AES (Advanced Encryption Standard). GRAND facilitates an optimal decoding process regardless of code. Data protection can be improved even in unsecured environments with the combination of machine technology learning and coding.