

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
School of Engineering Faculty Personnel Record

Date: November, 2010

Name: Muriel Médard
Department: Electrical Engineering
and Computer Science

1. Date of Birth: February 1, 1968

2. Citizenship: US

3. Education:

<u>School</u>	<u>Degree</u>	<u>Date</u>
MIT	Bachelor of Science in Electrical Engineering	1989
MIT	Bachelor of Science in Mathematics	1989
MIT	Master of Science in Electrical Engineering	1991
MIT	Bachelor of Science in Humanities (Russian Studies)	1991
MIT	Doctor of Science in Electrical Engineering (minor in Management)	1995

4. Title of Sc.D. Thesis:

The Capacity of Multiple User Time Varying Channels in Wireless Communications.

5. Principal Fields of Interest:

Information Theory. Networks, Communications.

6. Name and Rank of Other Faculty in the Same Field:

Vincent W. S. Chan, Professor
Robert G. Gallager, Professor
Jeffrey H. Shapiro, Professor
G. David Forney, Adjunct Professor
David Karger, Professor
Gregory W. Wornell, Professor
Lizhong Zheng, Associate Professor (without tenure)
Devavrat Shah, Assistant Professor

7. Name and Rank of Faculty in Other Departments in the Same Field

Eytan Modiano, Associate Professor (Aeronautics and Astronautics)
Moe Win, Associate Professor (Aeronautics and Astronautics)

8. Non-MIT experience:

<u>Employer</u>	<u>Position</u>	<u>Beginning</u>	<u>Ending</u>
University of Illinois Urbana-Champaign	Assistant Professor	August 1998	December 1999
NYNEX Science & Technology	Intern/consultant	June 1989	December 1989

9. History of MIT Appointments:

<u>Rank</u>	<u>Beginning</u>	<u>Ending</u>
MIT Lincoln Laboratory Staff Member	September 1995	June 1998
Assistant Professor	January 2000	January 2003
Associate Professor (without tenure)	January 2003	May 2005
Associate Professor (with tenure)	May 2005	May 2008
Professor	May 2008	

10. Consulting Record:

<u>Firm</u>	<u>Beginning</u>	<u>Ending</u>
NYNEX Science and Technology	September 1989	December 1989
Sycamore Networks	March 2000	June 2000
Pebbles Technologies/Malachite Technologies	June 2000	January 2004
Vanu Incorporated	June 2002	September 2003
Blackwave	July 2008	August 2009
MIT Lincoln Laboratory	October 2009	present
AT&T	March 2010	January 2011

11. Department and Institute Committees, Other Assigned Duties:

<u>Activity</u>	<u>Beginning</u>	<u>Ending</u>
Graduate Counselor (Dept)	September 2000	present
Graduate Admissions Reader (Dept) (domestic and international, for different years: Africa and Australia; Korea; China and Taiwan)	December 2000	January 2006
House Fellow, Green Hall (Institute)	September 2001	August 2002
Associate House Master, Simmons Hall (Institute)	March 2002	June 2006
Undergraduate Admissions Reader (Institute)	January 2004	January 2004
Organized "Meet Course VI" outreach event (Dept)	yearly since 2003	
Lemelson Prize Committee (Institute)	Fall 2000	
Sprolws Award Committee (Dept)	Spring 2003, Spring 2005	
Baker Housemaster Search Committee (Institute)	Fall 2004	
EECS Graduate Admissions Coordinator for Areas I and VII (Dept)	Fall 2004	Spring 2005
EECS Graduate Admissions Co-Coordinator for Area I (Dept)	Fall 2007	Spring 2008
EECS Graduate Admissions Co-Coordinator for Area I (Dept)	Fall 2005	Present
Search Committee Member (Dept)	Spring 2006	Spring 2006
Simmons Hall Associate Housemaster Search Committee (Institute)	Fall 2005	Spring 2006
Associate Director, Laboratory for Information and Decision Systems (Institute)	Fall 2005	Fall 2007
Next House Housemaster (Institute)	Fall 2006	Present
Member of the Committee on Student Life (Institute)	Fall 2006	Present
Member of the Search Committee for the Dean for Student Life (Institute)	Fall 2007	July 2008
Member of the Committee on Outside Professional	Fall 2007	Present

Activities (Institute)		
Dean for Undergraduate Education Faculty Advisory Committee (Institute)	Spring 2008	Present
Co-chair of the Student Life Committee of the Institute Task Force (Institute)	Spring 2009	Present
Student Engagement Committee (Institute)	Fall 2009	Present
Research Laboratory of Electronics Advisory Committee (Laboratory)	Spring 2009	Present

12. Professional Service:

<u>Activity</u>	<u>Beginning</u>	<u>Ending</u>
Program Committee Member for International Society for Optical Engineering (SPIE), Conference on Computer and Network Security	1996	1997
Co-organizer of session for Miniconference on Information Theory at the 1999 International Conference on Communications	1998	1999
Co-organizer of the new optical networking track for the Allerton Conference on Communication, Control, and Computing	1998	2003
Associate Editor for Networks, Journal of Optical Networks of the Optical Society of America	2001	2002
Member of the Information Science and Technology (ISAT) study group for DARPA on "Robust Networks for Critical Missions and Critical Infrastructure"	2002	2002
Organizer of the Optical Networks session for the 17 th IEEE Computer Communications Workshop	2002	2002
Technical Program Committee member for the High Speed Networking Conference, 2002	2001	2002
Technical Program Committee member for the 2004 IEEE International Symposium on Information Theory	2002	2004
Session Organizer, Wireless Communications and Networking Conference, 2003	2002	2002
Technical Program Committee member for the International Workshop on Design of Reliable Communication Networks (DCRN) 2003 (IEEE)	2002	2003
Technical Program Committee member for ITCOM 2003 (SPIE)	2002	2003
Guest Editor, IEEE Journal of Lightwave Technology Special Issue on Optical Networks	2002	2003
NSF Career review panelist	2002, 2003, 2006	
Co-organizer of the new network coding track for the Allerton Conference on Communication, Control, and Computing	2003	present
Program Committee Member, 2003 International Workshop on Optical Networks Control and Management (ONCM'03) (in conjunction with the 32nd International Conference on Parallel Processing)	2003	2003
Associate Editor, Optical Communications and Networking Series	2003	2007

of the IEEE Journal on Selected Areas in Communications		
Technical Program Committee Member, 2004 International Workshop on Wireless Ad-hoc Networks (IWWAN)	2003	2004
Associate Editor, Communications, for the IEEE Transactions on Information Theory	2003	2006
Treasurer, IEEE Information Theory Society	2004	2007
Co-organizer of an invited session on Network Coding for the 38th Annual Conference on Information Sciences and Systems, Princeton University	2003	2004
Co-organizer of an invited session on Network Coding for the Communication Theory Workshop	2003	2004
Member of the Information Science and Technology (ISAT), an advisory group to DARPA	2003	2006
Technical Program Committee member for Globecom 2004 Workshop on GMPLS	2004	2004
Technical Program Committee Member for the 2004 Information Theory Workshop	2003	2004
Technical Program Committee Member, 2005 International Workshop on Wireless Ad-hoc Networks (IWWAN)	2004	2005
Guest Editor, Joint Special Issue of the IEEE Transactions on Information Theory and the IEEE/ACM Transactions on Networking on Networking and Information Theory	2004	2006
Technical Program Committee Member, Symposium on Information Theory of Wireless Networks, as part of IEEE WirelessCom 2005	2004	2005
Technical Program Committee Member for the 2006 IEEE International Symposium on Information Theory	2005	2006
Technical Program Committee member for the International Workshop on Design of Reliable Communication Networks (DCRN) 2005 (IEEE)	2004	2005
Technical Program Committee member for Broadnets 2005	2005	2005
Co-chair of Netcod 2006 (Second Workshop on Network Coding, Theory, and Applications) in combination with WiOpt	2005	2006
Technical Program Committee member for the 2006 Information Theory Workshop	2005	2006
Session Organizer for the 2006 International Zurich Seminar on Communications (IZS)	2005	2006
Technical Program Committee member for the 2006 IEEE International Conference on Ultra Wideband (ICUWB)	2005	2006
Technical Program Committee Co-Chair for the 2007 IEEE International Symposium on Information Theory	2005	2007
Optics East 2006 ITCOM Technical Program, Committee Member	2005	2006
IEEE International Symposium on Personal, Indoor And Mobile Radio Communications (PIMRC '06) Technical Program Committee Member	2005	2006

IEEE Alexander Graham Bell Medal Committee	2006	present
Invited Session organizer for INFORMS 2006	2006	2006
Co-organizer of the Network Optimization track for the Allerton Conference on Communication, Control, and Computing	2006	2006
Technical Program Committee of Netcod 2006 (Third Workshop on Network Coding, Theory, and Applications)	2006	2006
Technical Program Committee Member RAWNET 2007, the third workshop on Resource Allocation in Wireless	2006	2007
Member of the Board of Governors for the IEEE Information Theory Society	2006	present
Associate Editor, IEEE Journal on Lightwave Communications	2007	present
Technical Program Committee Member, INFOCOM 2008	2007	2008
Technical Program Committee Member International Symposium on Information Theory and its Applications	2007	2008
Audit Committee Member for the School Computer and Communication Sciences of Ecole polytechnique fédérale de Lausanne (EPFL)	2007	present
Technical Program Committee Member International Communications Conference Optical Network Symposium	2007	2007
Tutorial co-chair PIMRC '08	2007	2008
Guest Editor in Chief IEEE Transactions on Information Forensics and Security: Special Issue on Statistical Methods for Network Security and Forensics	2007	2008
General co-chair, 2012 IEEE International Symposium on Information Theory	2008	present
Technical program member, International Symposium on Information Theory and its Applications 2008	2008	2008
Technical program member, IEEE International Workshop on Wireless Network Coding 2009	2008	2009
Technical program co-chair for IEEE/IFIP WiOpt (International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks) 2009	2008	2009
Session organizer for the IEEE Information Theory Workshop 2009	2008	2009
Technical program member, DRCN 2009	2008	2009
Technical program member, IEEE WINC 2009	2009	2009
Technical program member, CoCoNets 2009	2009	2009
Technical program member, IEEE Globecom Communication Theory Workshop	2009	2009
Technical program member, Network Coding Workshop 2009, 2010, 2008 2011		present
Technical program member, ITW 2010	2009	2010
Technical program member, ISIT 2010	2010	present
Technical program co-chair for ACM Conference on emerging Networking EXperiments and Technologies	2009	2010

(ACM CoNEXT 2010)		
Chair and founder, Outreach Committee IEEE Information Theory Society	2008	2009
Second Vice-President, IEEE Information Theory Society	2010	present
Founding member, Green Touch	2010	present
IEEE Hamming Medal Committee	Fall 2010	
IEEE Joseph Lo Cicero Award Committee	Fall 2010	
IEEE Donald W. McClellan Meritorious Service Award Committee	Fall 2010	
Chair, Joint Information Theory and Communication Society Best Paper Award Committee	Spring 2010	
Awards Committee Member for IEEE Information Theory Society	Spring 2011	
Chair, IEEE Chapter Award Committee	2010	
TPC member, WiOpt 2011	2010	
TPC member, Valuetools 2011	Spring 2011	
TPC member, ITW 2011	Spring 2011	

13. Awards Received:

<u>Award</u>	<u>Date</u>
NSF Career Award	2001
IEEE Leon K. Kirchmayer Prize Paper Award, presented by the IEEE Board of Directors for the most outstanding paper by an author(s) under 30 years of age, at the date of submission of the original manuscript for M. Médard, "The Effect Upon Channel Capacity in Wireless Communications of Perfect and Imperfect Knowledge of the Channel," <i>IEEE Transactions on Information Theory</i> , Vol. 46 Issue 3, May 2000, Pages: 935-946.	2002
Recipient of a 2003 Esther and Harold E. Edgerton MIT Chair	2002
Best Paper Award for G. Weichenberg, V. Chan, M. Médard, "Reliable Architectures for Networks Under Stress," Fourth International Workshop on the Design of Reliable Communication Networks (DRCN 2003), October 2003, Banff, Alberta, Canada	2003
Co-recipient of the Harold E. Edgerton Faculty Achievement Award, established in 1982 to honor junior faculty members "for distinction in research, teaching and service to the MIT community."	2004
Recognized in 2004 as a Siemens "outstanding mentor" for my work with high school students in science and engineering	2004
Gilbreth Lectureship, National Academy of Engineering	2007
2009 IEEE Communications Society and Information Theory Society Joint Paper Award for T. Ho, M. Médard, R. Koetter, D. R. Karger, M. Effros, J. Shi, and B. Leong, "A Random Linear Network Coding Approach to Multicast," <i>IEEE Transactions on Information Theory</i> , vol. 52, no. 10, pp. 4413-4430, October 2006.	2009
2009 William R. Bennett Prize in the Field of Communications	2009

Networking for S. Katti, Rahul, H., Hu, W. , Katabi, D., Médard, M., and Crowcroft, J., “XORs in the Air: Practical Wireless Network Coding”, *IEEE/ACM Transactions on Networking*, Volume 16, Issue 3, June 2008, pp. 497 - 510

14. Current Organization Membership:

<u>Organization</u>	<u>Offices Held</u>
IEEE Information Theory Society	Treasurer, January 2004-January 2007 Member, Board of Governors, started January 2007, Second Vice-President, 2010, First Vice-President started 2011
IEEE (Fellow)	
Eta Kappa Nu	
Tau Beta Pi	
Sigma Xi	

15. Patents and Patent Applications Pending:

1. M. Médard, S.G. Finn, R.A. Barry, R.G. Gallager., “Method and Apparatus for Automatic Protection Switching,” Patent # 6,047,331
2. M. Médard et al. “A Pseudorandom Noise Sequence Noise Generator,” patent # 6,201,870
3. M. Médard, S.R. Chinn., “Method and Apparatus for Detecting Security Attacks in Communication Networks,” Patent # 6,507,012 and # 6,507,012 B1
4. M. Médard, S.R. Chinn., “Method and Apparatus for Detecting Security Attacks in Communication Networks,” Patent # 6,603,112
5. R. Bergman, M. Médard, “Fault Isolation for Communication Networks for Isolating the Source of Faults Comprising Attacks, Failures, and Other Network Propagating Errors,” Patent # 6,442,694
6. S. Lumetta, M. Médard, “Fault Tolerant Optical Data Communication Network,” filed 2002, Application #10/186,178
7. S. Chinn, G. Ciancaglini, M. Garofalo, J. Hart, S. Lumetta, M. Lupinacci, M. Médard, J. D. Moores, G. Oliveira, S. Parikh, M. Parquette. W. Proulx, D. Proulx, M. Rydeen, “An Integrated System and Method for Controlling Telecommunication Network Data Communicated over a Local Area Network and Storage Data Communicated over a Storage Area Network,” Patent # 7,289,499
8. M. Garofalo, G. Ciancaglini, M. Médard, J. Hart, “Multiple Switch Protected Architecture,” Patent # 7,263,060
9. G. Ciancaglini, M. Garofalo, J. Hart, S. Lumetta, M. Médard, J. Moores, S. Parikh, M. Parquette, W. Proulx, M. Rydeen, “Fault Tolerant Optical Data Communication Network Having Auto Discovery,” Patent # 7,406,029
10. M. Médard et al., “Method and Apparatus for Medium Access Control for a Communications Network,” filed 2003, patent pending
11. T. Ho, R. Koetter, M. Médard, D. Karger, M. Effros, “Randomized Distributed Network Coding Method and Apparatus,” Application #10/992,463

12. D.S. Lun, M. Médard, T. Ho, R. Koetter, N. Ratnakar, "Minimum Cost Routing with Network Coding," Application #11/027,889, notice of allowance on April 2007
13. S. Deb, M. Médard, "A Network Coding Approach to Rapid Information Dissemination," patent application
14. S. Deb, M. Médard, R. Koetter, "A Random Linear Coding Approach to Distributed Data Storage," patent application
15. G. Ciancaglini et al., "Method and Apparatus for Provisioning Connection Oriented, Quality of Service Capabilities and Services," patent application
16. T. Ho, B. Leong, R. Koetter, D. Karger, M. Médard, M. Effros, "Byzantine Modification Detection in Multicast Networks Using Randomized Network Coding," patent application
17. R. Koetter, D. Lun, S. Licht, M. Médard, "Method for DNA Sequencing Inspired by Turbo Equalization," patent application
18. R. Koetter, D. Lun, S. Licht, M. Médard, "Method for High-Throughput DNA Sequencing Using Multiuser Detection," patent application
19. M. Médard, S. Ray, L. Zheng, "Fiber Aided Wireless Network Architecture," patent application, MIT Case No. 12137
20. A. Eryilmaz, M. Médard, A. Ozdaglar, "A Method for Coding-Based, Delay-Efficient Data Transmission," patent application
21. M. Médard, D. Shah, Jay-Kumar Sundararajan, "ARQ for Network Coding", M.I.T. Case No. 13100
22. J. F. Cordeiro De Oliveira Barros, J. P. Da Silva Machado Garcia Vilela, Muriel Medard, L. M. Moya Praca De Araujo Lima "Systems and Methods for Providing Confidentiality in Network Coding", M.I.T. Case No. 13202
23. A. ParandehGheibi. M. Kim, M. Médard, "Advertisements as keys for streaming protected content"

16. Professional Registration

NA

17. Major New Products

NA

Educational Contributions of Muriel Médard

1. Teaching materials

- a) In 6.441, I developed in Latex an all new set of lecture handouts, completely re-designed the syllabus, developed a substantial set of supplementary readings of relevant research papers, organized by relevance to different topics and by difficulty, introduced a research project on major papers in the literature.
- b) In 6.263, in collaboration with Dina Katabi, I significantly revised the course, wrote new lecture handouts, in particular in the areas of the use of transforms in analyzing queuing systems, of switching theory, of rerouting, of wireless networks and coding (including network coding); introduced a research design project and reading of major papers in the area.
- c) In 6.989, I developed a new graduate course on network coding, with research projects from the students.

2. Other educational contributions:

- a) Summer Professional Institute: co-instructor for 6.20S, Digital Communication Networks; significantly updated the curriculum. Co-instructor for 6.33S, Network Coding – created a new course with Dina Katabi.
- b) Developed a course on network coding in conjunction with Ralf Koetter of UIUC; the course was given at Centre for Wireless Communications at the University of Oulu, at the IEEE Global Telecommunications Conference (Globecom) in Dallas, at the International Symposium on Information Theory (ISIT) in Australia, at the International Workshop on Wireless and Ad Hoc Networks in New York, at the UCSD center for Information Theory and its Applications (ITA), and at IFIP Networking in Atlanta. It will be given at the Workshop on Network Coding in Hong Kong and at the International Symposium on Personal, Indoor and Mobile Radio Communications in France.
- c) I have supervised 27 projects of undergraduates, high school students and visiting graduate students, summarized as follows:
 - Chan, Serena, “Localization of Attacks in Optical Networks,” Summer 97 and January, 6-A student at MIT Lincoln Laboratory (Serena is now in the doctoral program at MIT)
 - Lin, Alvin, “Computer Simulation of Algorithms for Creating Minimal weight Redundant Trees in Edge-Redundant Graphs,” Summer 00, project through the Research Science Institute, run by the Center for Excellence in Education, to encourage promising U.S. high school students to pursue careers in science and engineering
 - Chan, Derrick, “Coding for ALOHA Systems,” 6.199 Advanced Undergraduate Project, Fall 2000
 - Divi, Vijay, “Heuristic Methods for Tree Selection,” UROP project, Spring 2001
 - Abdallah, Rami, “Error Probability in Wireless Channels,” project through the Research Science Institute, Summer 2001
 - Frey, Claudio, “Optimal Spreading Bandwidth in Ultrawideband Channels,” project through the Research Science Institute, Summer 2001
 - Tang, Jie, “Cycles in Large Networks,” project through the Research Science Institute (**project was semi-finalist in the Siemens competition**), Summer 2003

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- Ryu, Ho Seung (Paul), “Distribution of Node Degrees in Large Networks,” project through the Research Science Institute (**project was semi-finalist at the Siemens-Westinghouse Competition**), Summer 2003
- Bdeir, Ayah, “SNR adaptation for PSAM systems,” undergraduate visiting from American University of Beirut, Summer 2003,
- Fink, Evan, “Random Multicast Network Coding,” UROP project, Summer 2003
- Lee, Anna, “Rate-Splitting Implementation of Slepian-Wolf Source Coding,” UROP project, Summer, Fall 2003 and Spring 2004
- Choute, Clifford, “Network Coding in Gossip Networks,” UROP project, Spring 2004
- Lee, Hyunjoo (Jenny), “Network Coding with a Cost Criterion,” AUP, Spring 2004
- Muñoz-Torres, Enrique A., “Cycles and Reliability in Large Random Graphs,” AUP, Spring 2004
- Ahmed, Ebad, “Distributed Optimization for Multicast Network Coding,” UROP Summer 2004, Fall 2004, Spring and Summer, Fall 2005
- Acedanski, Szymon, “How Good is Random Linear Coding Based Distributed Networked Storage?” project through the Research Science Institute, Summer 2004
- Tan, Jianlong, “Network Coding for Security,” UROP Fall 2004, Spring 2005
- Vehkaperä, Mikko, “A Throughput-Delay Trade-Off in Packetized Systems with Erasures,” visiting student from Oulu University, Fall 2004, Spring 2005
- Miliou, Natalia visiting student from ETH Zurich, Summer, Fall 2005
- Loy, Jermaine, visiting student from Technical University Munich, Fall 2005
- Kim, Minji, UROP student, “Conflict Graphs for Network Coding,” Spring 2006
- Kim, Wonsik, UROP student, “Evolutionary Methods for Network Coding,” Summer 2006
- Lima, Luisa, visiting student from University of Porto, Portugal, Fall 2006, Spring 2008, Spring 2009
- Ming, Xiao, visiting student from Chalmers University, Sweden, Fall/Spring 2006/2007
- Traskov, Danail, visiting student from University of Illinois Urbana-Champaign/ Technical University of Munich, Summer 2007
- Singh, Jaspreet, visiting student from University of California Santa Barbara, Summer 2007
- Fawaz, Nadia, visiting student from Supelec/Eurecom, Fall 2007
- da Silva Machado Garcia Vilela, Joao Paulo from University of Porto, Portugal, Spring 2008
- Thakur, Mohit from Technical University Munich, Fall 2008, Spring 2010
- Soussi, Khaled from Technical University Munich, Fall 2008
- Pedersen, Morten from Aalborg University, Spring 2009
- Heide, Janus from Aalborg University, Spring 2009
- Chang, Christopher from Caltech, Summer 2009

Educational Contributions of Muriel Médard

Gorantla, Siva Kumar from University of Illinois Urbana-Champaign, Summer 2009

Mendes Alves da Costa, Rui Filipe from University of Porto, Summer 2009

Fouli, Kerim, INRS , Spring 2010

Jerome Casse, ENS, Spring/Summer 2010

Lorenzo Keller, EPFL, Summer 2010

William Souillard-Mandar UROP student, “Downloading a File Through Two Channels: Design and Analysis of Association Policies”, Summer-Fall 2010

Giuliano Pezzolo Ciacaglia, UROP student, “Systematic Network Coding for Time Division Duplexing with the aid of a Relay”, Summer-Fall 2010

Sila Sayan, UROP student, “TCP with Network Coding”, Summer-Fall 2010

Wesley Graybill, UROP student, “Galois Field Techniques for Network Coding”, Fall 2009, Spring 2010

Aysylu Biktimirova, UROP student, “Network Combining with Network Coding”, started Fall 2010

Amy Zhang, UROP student “Functional Compression for Cloud Computing”, started Spring 2011

Liz Deny, UAP student “Graph Coloring for Functional Compression”, started Spring 2011

Muriel Rambeloarison, UAP student “Adaptive Sampling”, started Spring 2011

Publications of Muriel Médard

1. Books
N.A.
2. Papers in Refereed Journals:
 1. M. Médard, Marquis, D., Barry, R.A., and Finn, S.G., "Security Issues in All-Optical Networks," *IEEE Network Magazine*, Vol. 11, Issue 3, pp. 42-48, May 1997.
 2. M. Médard, Chinn, S.R., Saengudomlert, P., "Attack Detection in All-Optical Networks," in *Trends in Optics and Photonics (TOPS)*-Vol. 20 -Optical Networks and their Applications, Barry, R.A., editor, published by the Optical Society of America, pp. 227-232, 1998. **
 3. S.G. Finn, Médard, M., Barry, R.A., "A New Algorithm for Bi-directional Link Self-Healing for Arbitrary Redundant Networks," in *Trends in Optics and Photonics (TOPS)*-Vol. 20-Optical Networks and their Applications, Barry, R.A., editor, published by the Optical Society of America, pp. 222-226, 1998.
 4. M. Médard, Barry, R.A., Finn, S.G., Gallager, R.G., "Automatic Protection Switching for Multicasting in Optical Mesh Networks," in *Trends in Optics and Photonics (TOPS)*-Vol. 20-Optical Networks and their Applications, Barry, R.A., editor, published by the Optical Society of America, pp. 216-221, 1998.
 5. M. Médard, Finn, S.G., Barry, R.A., Gallager, R.G., "Redundant Trees for Preplanned Recovery in Arbitrary Vertex-Redundant or Edge-Redundant Graphs," *IEEE/ACM Transactions on Networks*, Vol. 7, Issue 5, pp. 641 -652, October 1999.
 6. M. Médard, "The Effect Upon Channel Capacity in Wireless Communications of Perfect and Imperfect Knowledge of the Channel," *IEEE Transactions on Information Theory*, Vol. 46, Issue 3, pp. 935-946, May 2000. **(Winner of the IEEE 2002 Leon Kirchmayer Prize Paper Award)**
 7. S. Lumetta, Médard, M., and Tseng, Y., "Capacity Versus Robustness: A Tradeoff for Link Restoration in Mesh Networks," *IEEE Journal of Lightwave Technology*, Vol. 18, Issue 12, pp. 1765 -1775, March 2001. **
 8. M. Médard, Chinn, S.R., and Saengudomlert, P., "Node Wrappers for QoS Monitoring in Transparent Optical Nodes," *Journal of High Speed Networks* (yearly publication), IOS Press, pp. 247-268, 2001. **
 9. M. Médard and Lumetta, S.S., "Architectural Issues for Robust Optical Access," *IEEE Communications Magazine*, Vol. 39, Issue 7, pp. 116-220, July 2001.
 10. M. Médard, Barry, R.A., Finn, S.G., He, W., Lumetta, S.S., "Generalized Loop-back Recovery in Optical Mesh Networks," *IEEE/ACM Transactions on Networking*, Vol. 10, Issue 1, pp. 153-164, February 2002. **
 11. M. Médard and Gallager, R.G., "Bandwidth Scaling for Fading Multipath Channels," *IEEE Transactions on Information Theory*, Vol. 48, Issue 4, pp. 840 -852, April 2002.
 12. P. Saengudomlert and Médard, M., "Guaranteeing BER in Transparent Optical Networks Using OOK Signaling," *IEEE Journal on Selected Areas in Communications*, Vol. 20, Issue 4, pp. 786-799, May 2002. **
 13. M. Médard, Lumetta, S.S., and Li, L., "A Network Management Architecture for Robust Packet Routing in Mesh Optical Access Networks," invited paper in *IEEE Journal on Selected Areas in Communications*, Vol. 20, Issue 4, pp. 822-833, May 2002.
 14. R. Koetter and Médard, M., "Beyond Routing: An Algebraic Approach to Network

Publications of Muriel Médard

- Coding,” *IEEE/ACM Transactions on Networking*, Vol. 11, Issue 5, pp. 782-796, October 2003. (selected as one of the outstanding papers from INFOCOM for transfer to *IEEE/ACM Transactions on Networking*)
15. M. Jinho, Leonberger, F.J., Médard, M., Ransom, N., and Von Lehmen, A., “Guest Editorial: Optical Networks,” *IEEE Journal of Lightwave Technology*, Vol. 21, Issue 11, pp. 2452-2454, November 2003.
 16. M. Médard, “Channel Uncertainty in Communications,” invited paper in *IEEE Information Theory Society Newsletter*, starting on page 1 (4 pages), June 2003.
 17. M. Médard, Huang, J., Goldsmith, A., Meyn, S., and Coleman, T.P., “Capacity of Time-slotted ALOHA Packetized Multiple-Access Systems over the AWGN Channel,” *IEEE Transactions on Wireless Communications*, Vol. 3, Issue 2, pp. 486-499, March 2004. **
 18. D.S. Lun, Médard, M., and Abou-Fayçal, I.C., “On the Performance of Peak Capacity-achieving Signaling on Multipath Fading Channels,” *IEEE Transactions on Communications*, Vol. 52, Issue 6, pp. 931-938, June 2004. **
 19. T.P. Coleman and Médard, M., “A Distributed Scheme for Achieving Energy-Delay Tradeoffs with Multiple Service Classes over a Dynamically Varying Network,” *IEEE Journal on Selected Areas in Communications-Special Issue on Advanced Mobility Management and QoS Protocols for Wireless Internet*, Vol. 22, Issue 5, pp. 929-941, June 2004. **
 20. M. Effros, Médard, M., Ho, T., Ray, S., Karger, D., Koetter, R., and Hassibi, B., “Linear Network Codes: A Unified Framework for Source, Channel, and Network Coding,” *Advances in Network Information Theory, DIMACS Series in Discrete Mathematics and Theoretical Computer Science*, Vol. 66, pp. 197-216, Editors: Gupta et al., 2004. **
 21. G.E. Weichenberg, Chan, V.W.S., and Médard, M., “High-Reliability Topological Architectures for Networks under Stress,” *IEEE Journal on Selected Areas in Communications: Optical Communications and Networking Series*, Vol. 22, Issue 9, pp. 1830-1845, November 2004. **
 22. T. Ho, Médard M., and Koetter, R., “An Information Theoretic View of Network Management,” *IEEE Transactions on Information Theory*, Vol. 51, Issue 4, pp. 1295-1312, April 2005. **
 23. I. Abou-Fayçal, Médard, M., and Madhow, U., “Binary Adaptive Coded Pilot Symbol Assisted Modulation over Rayleigh Fading Channels without Feedback,” *IEEE Transactions on Communications*, Vol. 53, Issue 6, pp. 1036-1046, June 2005.
 24. D. Karger and Médard, M., “Toward Using the Network as a Switch,” *IEEE Journal on Selected Areas in Communications: Optical Communications and Networking Series*, Vol. 23, Issue 8, pp.1533-1541, August 2005.
 25. C. Luo, Médard, M., and Zheng, L., “On Achieving Wideband Capacity Using Multitone FSK,” *IEEE Journal on Selected Areas in Communications (JSAC)-Special Issue on Differential and Noncoherent Wireless Communications*, Vol. 23, Issue 9, pp. 1830-1838, September 2005. **
 26. D.S. Lun, Ratnakar, N., Médard, M., Koetter, R., Karger, D.R., Ho, T., Ahmed, E., and Zhao, F., “Minimum-Cost Multicast over Coded Packet Networks,” *IEEE Transactions on Information Theory*, Vol. 52, Issue 6, pp. 2608-2623, June 2006. **
 27. S. Deb, Médard, M., and Choute, C., “Algebraic Gossip: A Network Coding Approach to Optimal Multiple Rumor Mongering,” *IEEE Transactions on Information Theory*,

Publications of Muriel Médard

Vol. 52, Issue 6, pp. 2486-2507, June 2006. **

28. N. Cai, Chiang, N.M., Effros, M., Koetter, R., Médard, M., Prabhakar, B., Srikant, R., Towsley, D., and Yeung, R.W., "Introduction to the Special Issue on Networking and Information Theory," *IEEE Transactions on Information Theory*, Vol. 52, Issue 6, pp. 2285-2288, June 2006.
29. M. Médard and Srikant, R., "Capacity of Nearly-decomposable Markovian Fading Channels Under Asymmetric Receiver-sender Side Information," *IEEE Transactions on Information Theory*, Vol. 52, Issue 7, pp. 3052-3062, July 2006.
30. T.P. Coleman, Lee, A.H., Médard, M., and Effros, M., "Low-Complexity Approaches to Slepian-Wolf Near-Lossless Distributed Data Compression," *IEEE Transactions on Information Theory*, Vol. 52, Issue 8, pp. 3546-3561, August 2006. **
31. J. Huang, Meyn, S.P., and Médard, M., "Error Exponents for Channel Coding and Signal Constellation Design," *IEEE Journal on Selected Areas in Communications (JSAC)-Special Issue on Nonlinear Optimization of Communication Systems*, Vol. 24, Issue 8, pp.1647-1661, August 2006.
32. T. Ho, Médard, M., Koetter, R., Karger, D.R., Effros, M., Shi, J., and Leong, B., "A Random Linear Network Coding Approach to Multicast," *IEEE Transactions on Information Theory*, Vol. 52, Issue 10, pp. 4413-4430, October 2006. ** (**Winner of the 2009 of the IEEE Communication Society and Information Theory Society joint Paper Award**)
33. J.-S. Park, Lun, D.S., Yi, Y., Gerla, M., and Médard, M., "CodeCast: A Network Coding Based Ad Hoc Multicast Protocol," *IEEE Wireless Communications Magazine*, Vol. 13, Issue 5, pp. 76-81, October 2006. **
34. A.J. Goldsmith and Médard, M., "Capacity of Time-Varying Channels With Causal Channel Side Information," *IEEE Transactions on Information Theory*, Vol. 53, Issue 13, pp. 881-899, March 2007.
35. L. Zheng, Tse, D.N.C., and Médard, M., "Channel Coherence in the Low-SNR Regime," *IEEE Transactions on Information Theory*, Vol. 53, Issue 13, pp. 976-997, March 2007.
36. D. S. Lun, Jennings, L.D., Koetter, R. Licht, S., and Médard, M., "An Information-Based Computational Technique for Estimation of Chromatographic Peak Purity", *Journal of Chemical Information and Modeling*, Volume 47, Issue 5, pp. 1973 - 1978
37. S. Ray, Médard, M., and Zheng, L., "On Non-coherent MIMO Channels in the Wideband Regime: Capacity and Reliability," *IEEE Transactions on Information Theory*, Volume 53, Issue 6, June 2007, pp. 1983 – 2009. **
38. M. Effros, Koetter, R., and Médard, M., "Breaking Network Logjams," *Scientific American*, Vol. 296, Number 6, pp. 78-85, June 2007.
39. G. Weichenberg, Chan, V., and Médard, M., "On the Capacity of Optical Networks: A Framework for Comparing Different Transport Architectures," *IEEE Journal on Selected Areas in Communications: Optical Communications and Networking Series*, Volume 25, Issue 6, August 2007, pp. 84 – 101. **
40. J.-K. Sundararajan, Deb, S., and Médard, M., "Extending the Birkhoff-von Neumann Switching Strategy for Multicast-On the use of Optical Splitting in Switches," *IEEE Journal on Selected Areas in Communications: Optical Communications and Networking Series*, Volume 25, Issue 6, August 2007, pp. 36-50. **
41. D. S. Lun, Médard, M., Koetter, R., Effros, M., "On coding for reliable communication

Publications of Muriel Médard

- over packet networks”, *Physical Communication*, Volume 1, Issue 1, March 2008, pp. 3-20
42. S. Jaggi, Langberg M., Katti S., Ho T., Katabi D., Médard, M., and Effros, E., “Resilient Network Coding in the Presence of Byzantine Adversaries”, *Special Issue on Information-theoretic Security of the IEEE Transactions on Information Theory*, Volume 54, Issue 6, June 2008, pp. 2596 - 2603
 43. T. Ho, Leong, B., Koetter, R., Médard, M., and Effros, E., “Byzantine Modification Detection in Multicast Networks with Random Network Coding”, *Special Issue on Information-theoretic Security of the IEEE Transactions on Information Theory*, Volume 54, Issue 6, June 2008, pp. 2798-2803
 44. S. Katti, Rahul, H., Hu, W., Katabi, D., Médard, M., and Crowcroft, J., “XORs in the Air: Practical Wireless Network Coding”, *IEEE/ACM Transactions on Networking*, Volume 16, Issue 3, June 2008, pp. 497 – 510 (**winner of the 2009 William R. Bennett Prize in Network Communications**)
 45. S. Jing, Zheng, L., and Médard, M., “On Training with Feedback in Wideband Channels”, *IEEE Journal on Selected Areas in Communications: Special Issue on Limited Feedback*, Volume 26, Issue 8, October 2008, pp:1607 - 1614**
 46. L. D. Jennings, Lun, D. S., Médard, M., and Licht, S. “ClpP Hydrolyzes a Protein Substrate Processively and Independently with Respect to the ClpA ATPase: Mechanistic Studies of ATP-Independent Processive Proteolysis”, *Biochemistry*, 47(44):11536-11546, November 2008
 47. A. Eryilmaz, Ozdaglar, A., and Médard, M., “On the Delay and Throughput Gains of Coding in Unreliable Networks”, *IEEE Transactions on Information Theory*, Volume 54, Issue 12, December 2008, pp:5511 - 5524
 48. D. Lucani, Stojanovic, M., and Médard, M., “Channel Models and Network Coding based Lower Bound to Transmission Power for Multicast”, *IEEE Journal on Selected Areas in Communications: Special Issue on Underwater Acoustic Networks*, Volume 26, Issue 9, December 2008, pp:1708 - 1719**
 49. P. Youssef-Massaad, Zheng, L., and Médard, M., “Bursty Transmission and Glue Pouring: on Wireless Channels with Overhead Costs”, *IEEE Transactions on Wireless Communications*, Volume 7, Issue 12, Part 2, December 2008, pp:5188 - 5194 **
 50. G. Weichenberg, Chan, V., and Médard, M., “Design and Analysis of Optical Flow Switched Networks”, *IEEE/OSA Journal of Optical Communications and Optical Networking*, Volume 1, Issue 3, August 2009, pp:B81 - B97**
 51. W. Chen, Traskov, D., Heindlmaier, M., Médard, M., Meyn, S., and Ozdaglar, A., “Coding and Control for Communication Networks”, *Queueing Systems: 100 Years of Queueing - the Erlang Centennial*, Vol. 63, Nos 1-4, December 2009, pp. 195-216
 52. X. Shi, Lun, D.S., Médard, M., Kötter, R., Meldrim, J.C., Barry, A.J., “Joint Base-Calling of Two DNA Sequences With Factor Graphs,” *IEEE Transactions on Information Theory*, vol.56, no.2, pp.724-733, Feb. 2010**
 53. L. Lima, Gheorghiu, S., Barros, J., Médard, M., and Toledo, A. T. “Secure Network Coding for Multi-Resolution Wireless Video Streaming,” *IEEE Journal of Selected Areas in Communications*, vol. 28, Issue 3, March 2010, pp. 377-388
 54. M. Kim, Lima, L., Zhao, F., Barros, J, Médard, M., Koetter, R., Kalker, T. and Han, K., “On Counteracting Byzantine Attacks in Network Coded Peer-to-Peer Networks”, *IEEE*

Publications of Muriel Médard

Journal on Selected Areas in Communications: Special Issue on Mission-Critical Infrastructure, vol 28, Issue 5, May 2010, pp. 692-702**

55. G. Durrett, Médard, M., and O'Reilly U.-M., "A Genetic Algorithm to Minimize Chromatic Entropy", to be published in: P. Cowling and P. Merz (Eds.): *EvoCOP 2010*, LNCS 6022, pp. 59--70. Springer, Heidelberg (2010)
 56. A. ParandehGheibi, Eryilmaz, A., Ozdaglar, A., and Médard, M., "On Resource Allocation in Fading Multiple Access Channels -- An Efficient Approximate Projection Approach", *IEEE Transactions on Information Theory*, Vol. 56, No. 9, August 2010, pp. 4417-4437**
 57. M. Kim, Sundararajan, J.K, Médard, M., Eryilmaz, A., Koetter, R., "Network Coding in a Multicast Switch", *IEEE Transactions on Information Theory*, vol. 57, no. 1, 436 – 460, Jan. 2011**
 58. R. Kötter, Effros, M., Médard, M., "On a Theory of Network Equivalence", *IEEE Transactions on Information Theory*, February 2011
 59. S. Huang, Ramamoorthy, A. Médard, M., "Minimum cost mirror sites using network coding: Replication vs. coding at the source nodes", *IEEE Transactions on Information Theory*, February 2011, pp. 1080-1091.
 60. J. K. Sundararajan, Shah, D., Médard, M., Jakubczak, S., Mitzenmacher, M. and Barros, J., "Network Coding Meets TCP: Theory and Implementation", *Proceedings of the IEEE*, March 2011, pp. 490 – 512**
 61. S. Ray, Médard, M., Zheng, L., "Fiber Aided Network Wireless Architecture", *IEEE Journal of Selected Areas in Communications*, vol. 29, No. 6, June 2011, pp. 1284-1294**
 62. D. Lucani, Médard, M., Stojanovic, M., "On Coding for Delay - Network Coding for Time Division Duplexing", accepted to *IEEE Transactions on Information Theory***
 63. I. Maric, A. Goldsmith, "Analog Network Coding in the High-SNR Regime", accepted to *IEEE Transactions on Information Theory*
 64. A. Goldsmith, Effros, M., Koetter, R., Médard, M., Ozdaglar, A. and Zheng, L., "Beyond Shannon: The Quest for Fundamental Performance Limits of Wireless Ad Hoc Networks", *IEEE Communications Magazine*, vol. 49, no. 5, May 2011, pp. 195-205
1. Proceedings of Refereed Conferences:
 1. T.P. McGarty and Médard, M., "Wireless Architectural Alternatives: Current Economic Valuations Versus Broadband Options, The Gilder Conjecture," *Telecommunications Policy Research Conference*, Section 1, pp. 174-200, October 1994.
 2. M. Médard and Gallager, R.G., "The Issue of Spreading in Multipath Time-Varying Channels," *IEEE Vehicular Technology Conference (VTC)*, Volume 1, pp. 1-5, July 1995.
 3. M. Médard and Gallager, R.G., "The Effect of a Randomly Time-varying Channel on Mutual Information," *IEEE International Symposium on Information Theory (ISIT)*, pg. 139, September 1995.
 4. M. Médard and Gallager, R.G., "The Effect of Channel Variations upon Capacity," *IEEE Vehicular Technology Conference (VTC)*, Volume 3, pp. 1781-1785, April 1996.
 5. M. Médard, "Security Issues for All-Optical Networks," invited panelist statement, at the *National Information Systems Security Conference*, Volume 2, pg. 882, October 1996.

Publications of Muriel Médard

6. M. Médard, Finn, S.G., and Barry, R.A., "Automatic Protection Switching for Multicasting in Optical Mesh Networks," *Optical Fiber Communication Conference (OFC)*, pp. 314-315, February 1997.
7. S.G. Finn, Médard, M., and Barry, R.A., "A Novel Approach to Automatic Protection Switching," *IEEE International Conference on Communications (ICC)*, pp. 272-276, Vol.1, June 1997.
8. R.G. Gallager and Médard, M., "Bandwidth Scaling for Fading Channels," *IEEE International Symposium on Information Theory (ISIT)*, pg. 471, July 1997.
9. M. Médard and Goldsmith, A.J., "Capacity of Time-Varying Channels with Channel Side Information," *IEEE International Symposium on Information Theory (ISIT)*, pg. 372, July 1997.
10. A.H. Chan and Médard, M., "Reconfigurable Feedback Shift Registers," *IEEE International Symposium on Information Theory (ISIT)*, pg. 178, July 1997.
11. M. Médard, "Capacity of Correlated Jamming Channels," *Allerton Conference on Communication, Control, and Computing*, pp. 1043-1052, November 1997.
12. M. Médard, "Bound on Mutual Information for DS-CDMA spreading over Independent Channels," invited paper, *Asilomar Conference on Signals, Systems and Computers*, Volume1, pp. 187-191, October 1997.
13. D. Marquis, Médard, M., Barry, R.A., Finn, S.G., "Physical Security Considerations in All-Optical Networks," invited paper, *Proceedings of the International Society for Optical Engineering (SPIE)*, vol. 3228, pp. 260-271, November 1997.
14. M. Médard, Chan, A.H., Moores, J.D., Hall, K.A., Rauschenbach, K.R., and Parikh, S., "Ultrafast Cryptography Using Optical Logic in Reconfigurable Feedback Shift Registers," *Proceedings of the International Society for Optical Engineering (SPIE)*, vol. 3228, pp. 342-345, November 1997.
15. S.G. Finn, Médard, M., and Barry, R.A., "A New Algorithm for Bi-directional Self Healing for Arbitrary Redundant Networks," *Optical Fiber Communication Conference (OFC)*. pp. 298-299, February 1998
16. M. Médard, Chinn, S.R., and Saengudomlert, P., "Attack Detection in All-optical Networks," *Optical Fiber Communication Conference (OFC)*, pp. 272-273, February 1998. **
17. R. Bergman, Médard, M., and Chan, S., "Distributed Algorithms for Attack Localization in All-Optical Networks," *Internet Society Network and Distributed System Security (NDSS) Symposium*, Session 3, paper 1 (15 pages), February 1998.
18. M. Médard, Marquis, D., and Chinn, S.R., "Attack Detection Methods for All-Optical Networks," *Internet Society Network and Distributed System Security (NDSS) Symposium*, Session 3, paper 2 (17 pages), February 1998.
19. Barry, R.A. and Médard, M., "BER Analysis of Low-rate Communications Through a Single Electro-Optic R2 Nonlinear Regenerator," *IEEE Conference on Lasers and Electro-Optics (CLEO)*, pp. 455-456, May 1998.
20. R.G. Gallager, Médard, M., Barry, R.A., and Finn, S.G., "Multicast Automatic Protection Switching in Arbitrary Redundant Graphs," *IEEE International Conference on Communications (ICC)*, Volume 1, pp. 640-644, June 1998.
21. J. Yueh, Chan, A.H., and Médard, M., "On the Complexity of Reconfigurable Feedback Shift Register Sequences," *IEEE International Symposium on Information Theory (ISIT)*,

Publications of Muriel Médard

- pg. 133, August 1998.
22. M. Médard, "A Coding Theorem for Multiple-Access Decorrelating Channels," *IEEE International Symposium on Information Theory (ISIT)*, pg. 215, August 1998.
 23. M. Médard, "Secure Optical Communications," invited paper, FE3, *Lasers and Electro-Optics Society (LEOS) Annual Meeting*, pp. 323-324, Vol.2, December 1998.
 24. M. Médard, Finn, S.G., and Barry, R.A., "WDM Loop-back in Mesh Networks," *Annual Joint Conference of the IEEE Computer and Communications Societies (INFOCOM)*, pp. 752-759. Vol.2, March 1999.
 25. M. Médard and Goldsmith, A.J., "Capacity of Time-Varying Channels with Side Information at the Sender and the Receiver," *Miniconference on Information Theory, IEEE International Conference on Communications (ICC)*, pp. 16-20, June 1999.
 26. M. Médard, "Processing of Wireless Signals to Preserve Wireline Network Resources," invited paper, *IEEE Wireless Communications and Networking Conference (WCNC)*, Volume 1, pp. 61-65, September 1999.
 27. M. Médard and Goldsmith, A., "Capacity of Time-Slotted ALOHA Systems," invited paper, *IEEE Wireless Communications and Networking Conference (WCNC)*, Volume 1, pp. 490-494, September 1999.
 28. M. Médard, Huang, J., Meyn, S.P., and Goldsmith, A., "Capacity of Time-Slotted ALOHA Systems," *IEEE International Symposium on Information Theory (ISIT)*, pg. 407, June 2000. **
 29. M. Médard and Srikant, R., "Capacity of Nearly-decomposable Markovian Fading Channels under Asymmetric Receiver-Sender Side Information," *IEEE International Symposium on Information Theory (ISIT)*, pg. 413, June 2000.
 30. S.S. Lumetta and Médard, M., "Robust Routing for Local Area Optical Access Networks," *IEEE Lasers and Electro-Optics Society (LEOS) Summer Topical Meeting*, pp. IV39-IV40, July 2000.
 31. M. Médard, Lumetta, S.S., and Tseng, Y., "Capacity-Efficient Restoration for Optical Networks," *Optical Fiber Communication Conference (OFC)*, paper ThO2, pp. 207-209, March 2000. **
 32. M. Médard and Tse, D.N.C., "Spreading in Block-Fading Channels," *Asilomar Conference on Signals, Systems, and Computers*, Volume 2, pp. 1598-1602, November 2000.
 33. P. Saengudomlert and Médard, M., "Limits of BER Guarantees in Transparent Optical Networks Using OOK Signaling," invited paper, *38th Annual Allerton Conference on Communication, Control, and Computing*, Volume 1, pp. 583-592, October 2000. **
 34. M. Médard, Abou-Fayçal, I., and Madhow, U., "Adaptive Coding with Pilot Signals," invited paper, *38th Annual Allerton Conference on Communication, Control, and Computing*, pp. 337-346, October 2000. **
 35. M. Médard and Srikant, R., "The Effect on Capacity of Decoupling Slow Fades from Fast Fades in Channels with Asymmetric Channel Information," *IEEE International Symposium on Information Theory and its Applications (ISITA)*, pp. 697-700, November 2000.
 36. S.S. Lumetta and Médard, M., "Classification of Two-link Failures in All-optical Networks," *Optical Fiber Communication Conference (OFC)*, Volume 1, pp. TuO3- 1-TuO3-3, March 2001.
 37. A. Narula-Tam, Finn, S.G., and Médard, M., "Analysis of Reconfiguration of IP over

Publications of Muriel Médard

- WDM Access Networks,” *Optical Fiber Communication Conference (OFC)*, sponsored by the Optical Society of America, Volume 1, pp. MN4-1 -MN4-3, March 2001.
38. S. Lumetta and Médard, M., “Towards a Deeper Understanding of Link Restoration Algorithms for Mesh Networks,” *Annual Joint Conference of the IEEE Computer and Communications Societies (INFOCOM)*, Volume 1, pp. 367-375, April 2001.
 39. R. Koetter and Médard, M., “An algebraic approach to network coding and robust networks,” *IEEE International Symposium on Information Theory (ISIT)*, pg. 104, June 2001.
 40. A.L. Libarikian and Médard, M., “A Robust Optical Folded Bus Architecture for Overlay Access Networks,” invited paper, *39th Annual Allerton Conference on Communication, Control, and Computing*, pp. 633-645, October 2001. **
 41. T.P. Coleman and Médard, M., “Trade-off Between Power Consumption and Delay in Wireless Packetized Systems,” invited paper, *39th Annual Allerton Conference on Communication, Control, and Computing*, pp. 501-512, October 2001. **
 42. R. Koetter and Médard, M., “Beyond Routing: An Algebraic Approach to Network Coding,” *Annual Joint Conference of the IEEE Computer and Communications Societies (INFOCOM)*, Volume 1, pp. 122-130, July 2002. **(selected as one of the outstanding papers from INFOCOM for transfer to IEEE/ACM Transactions on Networking)**
 43. H. Wang, Modiano, E., and Médard, M., “Using Local Information for WDM Network Protection,” invited paper, *Symposium on Photonics, Networks and Computing, (JCIS)*, pp. 1398-1401, March 2002. **
 44. H. Wang, Modiano, E., and Médard, M., “Partial Path Protection for WDM networks,” *Sixth Institute for Operations Research and the Management Sciences (INFORMS) Telecommunications Conference*, paper ME01.2 (2 pages), March 2002. **
 45. D.S. Lun, Médard, M., and Abou-Fayçal, I., “Error Exponents for Wideband Multipath Fading Channels—a Strong Coding Theorem,” *Conference on Information Sciences and Systems (CISS)*, Princeton, pp. 866-870, April 2002. **
 46. T. Ho, Médard, M., and Koetter, R., “A Coding View of Network Recovery and Management for Single Receiver Communications,” *Conference on Information Sciences and Systems (CISS)*, Princeton, pp. 590-597, April 2002, **
 47. M. Médard, “Optical Network Survivability Beyond the Core,” invited paper, *Proceedings of the International Society for Optical Engineering (SPIE)*, Volume 4872, pp. 239-253, July 2002.
 48. H. Wang, Modiano, E., and Médard, M., “Partial Path Protection for WDM Networks: End-to-End Recovery Using Local Failure Information,” *IEEE Symposium on Computers and Communications (ISCC)*, pp. 719-725, July 2002. **
 49. T. Ho, Médard, M., and Koetter, R., “A Coding View of Network Capacity, Recovery and Management,” *International Symposium on Information Theory*, pg. 137, July 2002. **
 50. D.S. Lun, Médard, M., and Abou-Fayçal, I., “An Upper Bound on the Error probability of Capacity-Achieving Signaling On Broadband Rayleigh Fading Channels,” *IEEE Vehicular Technology Conference*, Volume 1, pp. 577-581, September 2002. **
 51. C. Luo and Médard, M., “FSK for Ultrawideband—How Close to Capacity Can We Get?” *International Symposium on Information Theory and its Applications*, pp. 839-842, October 2002. **
 52. D.S. Lun, Médard, M., and Abou-Fayçal, I., “Error Exponents for Capacity-Achieving

Publications of Muriel Médard

- Signaling on Wideband Rayleigh Fading Channels,” *International Symposium on Information Theory and its Applications*, pp. 255-258, October 2002. **
53. C. Luo and Médard, M., “Frequency Shift Keying for Ultrawideband-Achieving rates of the Order of Capacity,” invited paper, *40th Annual Allerton Conference on Communication, Control, and Computing*, Volume 2, pp. 785-796, October 2002. **
 54. I. Abou-Fayçal, Médard, M., and Madhow, U., “Adaptive Coding for PSAM Without Feedback,” invited paper, *Asilomar Conference on Signals, Systems, and Computers*, Volume 2, pp. 1503-1507, November 2002.
 55. C. Luo and Médard, M., “Performance of Single-tone and Two-tone Frequency-shift keying for Ultrawideband,” *Asilomar Conference on Signals, Systems, and Computers*, Volume 1, pp. 701-705, November 2002. **
 56. M. Effros, Médard, M., Ho T., Ray, S., Karger, D., and Koetter, R., “Linear Network Codes: A Unified Framework for Source Channel, and Network Coding,” invited paper to the *DIMACS Workshop on Network Information Theory, DIMACS Series in Discrete Mathematics and Theoretical Computer Science*, Volume 66, American Mathematical Society, pp. 197-216, 2003. **
 57. T. Ho, Médard, M., and Koetter, R., “An Information-Theoretic View of Network Management,” *Annual Joint Conference of the IEEE Computer and Communications Societies (INFOCOM)*, Volume 2, pp. 1456-1466, July 2003. **
 58. T. Ho, Koetter, R., Médard, M., Karger, D.R., and Effros, M., “The Benefits of Coding over Routing in a Randomized Setting,” *IEEE International Symposium on Information Theory (ISIT)*, pg. 442, June 2003. **
 59. T. Ho, Karger, D.R., Médard, M., and Koetter, R., “Network Coding from a Network Flow Perspective,” *IEEE International Symposium on Information Theory (ISIT)*, pg. 441, June 2003. **
 60. T. Coleman and Médard, M., “The Impact of User Information on Power-Delay Tradeoffs Between in Bursty Packetized Systems,” *IEEE International Symposium on Information Theory (ISIT)*, pg. 440, June 2003. **
 61. N. Peranginangin, Médard, M., and Gallager, R., “Capacity of a Multi Output Channel with Distributed Processing,” *IEEE International Symposium on Information Theory (ISIT)*, Yokohoma, Japan, pg. 97, June 2003. **
 62. A.F. Dana, Gowaikar, R., Hassibi, B., Effros, M., and Médard, M., “Should we Break a Wireless Network into Subnetworks?” *41st Allerton Annual Conference on Communication, Control and Computing*, Vol. 1, pp. 50-59, October 2003.
 63. S. Ray, Médard, M., and Abounadi, J., “Noise-Free Multiple Access Networks Over Finite Fields,” *41st Allerton Annual Conference on Communication, Control and Computing*, Vol. 1, pp. 510-511, October 2003. **
 64. L. Zheng, Médard, M., Tse, D.N.C., and Luo, C., “On the Interplay Between SNR and Coherence in Wideband Channels,” invited paper, *41st Allerton Annual Conference on Communication, Control and Computing*, Vol. 1, pp. 420, 429, October 2003. **
 65. T. Ho, Médard, M., Shi, J., Effros, M., and Karger, D., “On Randomized Network Coding,” invited paper, *41st Allerton Annual Conference on Communication, Control and Computing*, Volume 1, pp. 21-29, October 2003. **
 66. M. Médard, Effros, M., Ho, T., and Karger, D., “On Coding for Non-Multicast Networks,” invited paper, *41st Allerton Annual Conference on Communication, Control*

Publications of Muriel Médard

- and Computing*, Volume 1, pp. 11-20, October 2003. **
67. G. Weichenberg, Chan, V., and Médard, M., "Reliable Architectures for Networks Under Stress," *Fourth International Workshop on the Design of Reliable Communication Networks (DRCN)*, pp. 263-271, October 2003. (**Winner of the Best Paper Award**) **
 68. S. Ray, Médard, M., and Abounadi, J., "Random Coding in Noise-Free Multiple Access Networks over Finite Fields," *IEEE Global Telecommunications Conference (Globecom) Communication Theory Workshop*, 1898-1902, Vol.4, December 2003. **
 69. C. Zheng and Médard, M., "How Far Should We Spread Using DS-CDMA in Time and Frequency Selective Fading Channels?" *IEEE Global Telecommunications Conference (Globecom) Communication Theory Workshop*, Volume 3, pp. 1563-1567, December 2003. **
 70. C. Luo, Médard, M., and Zheng, L., "Error Exponents for Multi-tone Frequency Shift Keying on Wideband Rayleigh Fading Channels," *IEEE Global Telecommunications Conference (Globecom) Wireless Communications Workshop*, Volume 2, pp. 779-783, December 2003. **
 71. M. Kim and Médard, M., "Robustness in Large-Scale Random Networks," *Annual Joint Conference of the IEEE Computer and Communications Societies (INFOCOM) 2004*, pp. 2364 -2373, March 2004. **
 72. G. Weichenberg, Chan, V., and Médard, M., "High-Reliability Architectures for Networks Under Stress," *Annual Joint Conference of the IEEE Computer and Communications Societies (INFOCOM) 2004*, pp. 131-141, March 2004. **
 73. G. Weichenberg, Médard, M., and Chan, V., "Designing for Resilience to Multiple Failures," invited paper, *Optical Fiber Communication Conference (OFC)*, sponsored by the Optical Society of America, Vol. 2, pp. 224-227, March 2004. **
 74. T.P. Coleman, Lee, A.H., Médard, M., and Effros, M., "On Some New Approaches to Practical Slepian-Wolf Compression Inspired by Channel Coding," *2004 IEEE Data Compression (DCC) Conference*, Snowbird Utah, pp. 282-291, March 2004. **
 75. R. Koetter, Effros, M., Ho, T., and Médard, M., "Network Codes as Codes on Graphs," invited paper, *38th Annual Conference on Information Sciences and Systems*, Princeton, paper 632 (6 pages), March 2004. **
 76. T. Ho, Médard, M., Effros, M., and Koetter, R., "Network Coding for Correlated Sources," invited paper, *38th Annual Conference on Information Sciences and Systems*, Princeton, paper 601 (6 pages), March 2004. **
 77. L. Zheng, Tse, D.N.C., and Médard, M., "Channel Coherence in the Low SNR Regime," invited paper, *38th Annual Conference on Information Sciences and Systems*, Princeton, paper 604 (6 pages), March 2004. **
 78. T. Ho, Leong, B., Médard, M., Koetter, R., Chang, Y., and Effros, M., "On the utility of network coding in dynamic environments," *International Workshop on Wireless Ad-hoc Networks (IWVAN)*, Special Session Tuesday, Paper 5 (5 pages), June 2004. (**Winner of the Best Student Paper Award**) **
 79. A. Bdeir, Abou-Fayçal, I., and Médard, M., "Power Allocation Schemes for Pilot Symbol Assisted Modulation over Rayleigh Fading Channels with no Feedback," *Communication Theory Symposium of the IEEE International Conference on Communications (ICC 2004)*, Vol. 2, pp. 731-742, June 2004. **

Publications of Muriel Médard

80. I. Abou-Fayçal and Médard, M., “Optimal Uncoded Regeneration for Binary Antipodal Signaling,” *Communication Theory Symposium of the IEEE International Conference on Communications (ICC 2004)*, Vol. 2, pp. 224-227, June 2004.
81. T. Ho, Leong, B., Koetter, R., Médard, M., and Effros, M., “Byzantine Modification Detection in Multicast Networks using Randomized Network Coding,” *IEEE International Symposium on Information Theory*, pg. 144, June 2004. **
82. T.P. Coleman, Lee, A.H., Médard, M., and Effros, M., “A New Source-Splitting Approach to the Slepian-Wolf Problem,” *IEEE International Symposium on Information Theory*, pg. 332, June 2004. **
83. L. Zheng, Tse, D.N.C., and Médard, M., “Channel Coherence in the Low SNR Regime,” *IEEE International Symposium on Information Theory*, pg. 416, June 2004.
84. J. Huang, Meyn, S., and Médard, M., “Error Exponents for Channel Coding and Signal Constellation Design,” *IEEE International Symposium on Information Theory*, pg. 478, June 2004.
85. D.S. Lun and Médard, M., “On the Sufficiency of Power Control for a Class of Channels with Feedback,” *IEEE International Symposium on Information Theory*, pg. 73, June 2004. **
86. D.S. Lun and Médard, M., “On Coding for Reliable Communication over Packet Networks,” invited paper, *42nd Allerton Annual Conference on Communication, Control and Computing*, paper 42-277 (10 pages), October 2004. **
87. S. Jaggi, Effros, M., Ho, T., and Médard, M., “On Linear Network Coding,” invited paper, *42nd Allerton Annual Conference on Communication, Control and Computing*, paper 42-263 (10 pages), October 2004.
88. P.G. Youssef-Massaad, Médard, M., and Zheng, L., “On the Capacity of Multiple-access Channels with Processing Power,” invited paper, *42nd Allerton Annual Conference on Communication, Control and Computing*, paper 42-279 (10 pages), October 2004. **
89. S. Deb and Médard, M., “Algebraic Gossip: A Network Coding Approach to Optimal Multiple Rumor Mongering,” *42nd Allerton Annual Conference on Communication, Control and Computing*, paper 42-121 (10 pages), October 2004.
90. S. Ray, Médard, M., Zheng, L., and Abounadi, J., “On the Sublinear Behavior of MIMO Channel Capacity at low SNR,” *International Symposium on Information Theory and its Applications (ISITA 2004)*, pp. 1031-1034, October 2004. **
91. P.G. Massaad, Médard, M., and Zheng, L., “Impact of Processing Energy on the Capacity of Wireless Channels,” *International Symposium on Information Theory and its Applications (ISITA 2004)*, pp. 1580-1585, October 2004. **
92. D.S. Lun, Médard, M., Ho, T., and Koetter, R., “Network Coding with a Cost Criterion,” *International Symposium on Information Theory and its Applications (ISITA 2004)*, pp. 1232-1237, October 2004. **
93. M. Effros, Koetter, R., Goldsmith, A., and Médard, M., “On Source and Channel Codes for Multiple Inputs and Outputs: Does Multiple Description Meet Space Time?” invited paper, *Information Theory Workshop*, pp. 324-329, October 2004.
94. L. Zheng, Tse, D., and Médard, M., “On the Costs of Channel State Information,” invited paper, *Information Theory Workshop*, pp. 423-427, October 2004.
95. S. Ray, Médard, M., and Zheng, L., “On MIMO in the Wideband Limit,” invited paper, *Asilomar Conference on Signals, Systems, and Computers*, pp. 1516-1520, November

Publications of Muriel Médard

2004. **

96. J.K. Sundararajan, Zhao, F., Massaad, P.G., and Médard, M., “A Modification to RED AQM for CIOQ Switches,” *IEEE Global Telecommunications Conference (Globecom)*, pp. 1708-1712, December 2004. **
97. T.P. Coleman, Médard, M., and Effros, M., “Towards Bridging the Gap Between Theory and Practice for the Slepian-Wolf Problem,” invited paper, *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, pp. v/1105-1108, March 2005. **
98. D.S. Lun, Ratnakar, N., Koetter, R., Médard, M., Ahmed, E., and Lee, H., “Achieving Minimum-Cost Multicast: A Decentralized Approach Based on Network Coding,” *Annual Joint Conference of the IEEE Computer and Communications Societies (INFOCOM)*, pp. 1607-1617, March 2005. **
99. T.P. Coleman, Médard, M., and Effros, M., “Towards Practical Minimum-Entropy Universal Decoding,” *IEEE Data Compression Conference (DCC)*, Snowbird Utah, pp. 33-42, March 2005. **
100. S. Ray, Médard, M., and Zheng, L., “On Error Probability for Wideband MIMO Channels,” *Conference on Information Sciences and Systems (CISS)*, Johns Hopkins, TP6-Paper 5 (5 pages), March 2005. **
101. C. Luo, Médard, M., and Zheng, L., “On Capacity-Achieving Distribution in Rician Fading Channels,” *Conference on Information Sciences and Systems (CISS)*, Johns Hopkins, WA2-Paper 5 (5 pages), March 2005. **
102. S. Acedanski, S. Deb, Médard, M., and Koetter, R., “How Good is Random Linear Coding Based Distributed Networked Storage?” **invited paper**, *First Workshop on Network Coding, Theory, and Applications*, Session 3, Paper 1 (6 pages), April 2005. **
103. T.P. Coleman, Médard, M., and Effros, M., “Practical Universal Decoding for Combined Routing and Compression in Network Coding,” *First Workshop on Network Coding, Theory, and Applications*, Session 3, Paper 4 (6 pages), April 2005. **
104. D.S. Lun, Médard, M., and Karger, D., “On the Dynamic Multicast Problem for Coded Networks,” *First Workshop on Network Coding, Theory, and Applications*, Session 3, Paper 3 (6 pages), April 2005. **
105. T. Ho, Leong, B., Koetter, R., and Médard, M., “Distributed Asynchronous Algorithms for Multicast Network Coding,” *First Workshop on Network Coding, Theory, and Applications*, Session 3, Paper 2 (6 pages), April 2005. **
106. J. K. Sundararajan, Deb, S., and Médard, M., “Extending the Birkhoff-Von Neumann Switching Strategy to Multicast Switches,” *NETWORKING 2005*, pp. 1321-1325, May 2005 (appears in *Lecture Notes in Computer Science*, Springer Verlag, vol. 3462/2005). **
107. S. Deb, Effros, M., Ho, T., Karger, D., Koetter, R., Lun, D.S., Médard, M., and Ratnakar, N., “Network Coding for Wireless Applications; A Brief Tutorial,” **invited paper**, *International Workshop on Wireless and Ad-hoc Networks (IWWAN)*, Paper 81 (3 pages), May 2005. **
108. T.P. Coleman, Médard, M., and Effros, M., “Linear Complexity Universal Decoding with Exponential Error Probability Decay,” *Wireless Com Symposium on Information Theory, 2005*, Volume 2, pp. 1593-1596, June 2005. **
109. D.S. Lun, Médard, M., and Koetter, R., “Efficient Operation of Wireless Packet Networks Using Network Coding,” **invited paper**, *International Workshop on*

Publications of Muriel Médard

- Convergent Technologies*, Session 8, Paper 1, (5 pages), June 2005. **
110. C. Pandit, Huang, J., Meyn, S., Médard, M., and Veeravalli, V., “Entropy, Inference, and Channel Coding,” *Proceedings of the Institute for Mathematics and its Applications Summer Workshop on Wireless Communications*, Thursday-Friday Paper 2 (25 pages), July 2005.
 111. T.P. Coleman, Martinian, E., Effros, M., Médard, M., “Interference Management via Capacity-Achieving Codes for the Deterministic Broadcast Channel,” *Information Theory Workshop*, pp. 29-33, August 2005. **
 112. T.P. Coleman, Effros, M., Martinian, E., and Médard, M., “Rate Splitting for the Broadcast Channel,” *International Symposium on Information Theory*, pp. 2189 – 2192, September 2005. **
 113. A. Lee and Médard, M., “Simplified Random Network Codes for Multicast Networks,” *International Symposium on Information Theory*, pp.1725 – 1729, September 2005. **
 114. S. Ray, Médard, M., and Zheng, L., “Wideband Non-coherent MIMO Capacity,” *International Symposium on Information Theory*, pp. 646 – 650, September 2005. **
 115. C. Luo, Médard, M., Zheng, L., and Lun, D.S., “Multi-tone FSK with Feedback,” *International Symposium on Information Theory*, pp. 112 – 116, September 2005. **
 116. D.S. Lun, Médard, M., Koetter, R., and Effros, M., “Further Results on Coding for Reliable Communication over Packet Networks,” *International Symposium on Information Theory*, pp. 1848 – 1852, September 2005. **
 117. M. Vehkaperä and Médard, M., “A Throughput-Delay Trade-Off in Packetized Systems With Erasures,” *International Symposium on Information Theory*, pp. 1858-1862, September 2005. **
 118. S. Deb, Médard, M., and Choute, C., “On Random Network Coding Based Information Dissemination,” *International Symposium on Information Theory*, pp. 278-282, September 2005. **
 119. S. Ray, Médard, M., and Zheng, L., “Fiber Aided Wireless Network Architecture: A SISO wireless-optical channel,” **invited paper**, *Allerton Annual Conference on Communication, Control and Computing*, pp. 1993-2002, October 2005. **
 120. S. Katti, Katabi, D., Hu, W., Rahul, H., and Médard, M., “The Importance of Being Opportunistic: Practical Network Coding for Wireless Environments,” **invited paper**, *Allerton Annual Conference on Communication, Control and Computing*, pp. 756-765, October 2005.
 121. R. Cristescu, Effros, M., and Médard, M., “On the Capacity of a Binary MIMO Channel with Random Interference,” *Allerton Annual Conference on Communication, Control and Computing*, pp. 1970-1979, October 2005.
 122. D.S. Lun, Médard, M., Koetter, R., “Network Coding for Efficient Wireless Unicast,” **invited paper**, *IEEE International Zurich Seminar on Communications*, pp. 74-77, February 2006. **
 123. D. Katabi, Katti, S., Hu, W., Rahul, H., and Médard, M., “On Practical Network Coding for Wireless Environments,” **invited paper**, *IEEE International Zurich Seminar on Communications*, pp. 84-85, February 2006.
 124. S. Jing, Zheng, L., and Médard, M., “On the use of sounding in wideband channels,” **invited paper**, *IEEE International Zurich Seminar on Communications*, pp. 170-173, February 2006. **

Publications of Muriel Médard

125. T.P. Coleman and Médard, M., "On Low-Complexity Decodable Universally Good Linear Codes," **invited paper**, *UCSD Information Theory and Applications Inaugural Workshop*, 5 pages, February 2006. **
126. J.K. Sundararajan, Médard, M., Koetter, R., and Erez, E., "A Systematic Approach to Network Coding Problems using Conflict Graphs," **invited paper**, *UCSD Information Theory and Applications Inaugural Workshop*, 5 pages, February 2006. **
127. T.P. Coleman, Médard, M., and Effros, M., "Time-Sharing Vs. Source-Splitting in the Slepian-Wolf Problem: Error Exponents Analysis," *Data Compression Conference*, pp. 53-62, March 2006. **
128. A. Eryilmaz, Ozdaglar, A., and Médard, M., "On Delay Performance Gains from Network Coding," **invited paper**, *Proceedings of the Conference on Information Sciences and Systems*, pp. 864-870, Princeton, 2006.
129. G.E. Weichenberg, Chan, V.W.S., and Médard, M., "On the Capacity of Optical Networks: A Framework for Comparing Different Transport Architectures," *INFOCOM*, pp. 1-13, April 2006. **
130. D.S. Lun, Pakzad, P., Fragouli, C., Médard, M., and Koetter, R., "An Analysis of Finite-Memory Random Linear Coding on Packet Streams," *Netcod 2006 (Second Workshop on Network Coding, Theory, and Applications)*, Session 4, Paper 2 (6 pages), April 2006. **
131. J. Tan and Médard, M., "Secure Network Coding with a Cost Criterion," *Netcod 2006 (Second Workshop on Network Coding, Theory, and Applications)*, Session 4, Paper 3 (6 pages), April 2006. **
132. M. Kim, Ahn, C. W., Médard, M., and Effros, M., "On Minimizing Network Coding Resources: An Evolutionary Approach," *Netcod 2006 (Second Workshop on Network Coding, Theory, and Applications)*, Session 3, Paper 1 (6 pages), April 2006. **
133. S. Ray, Moulin, P., and Médard, M., "On Jamming in the Wideband Regime," *International Symposium on Information Theory (ISIT)*, 2574-2577, July 2006. **
134. S. Ray, Zheng, L., and Médard, M., "A SIMO Fiber Aided Wireless Network Architecture," *ISIT*, pp. 2904-2908, July 2006. **
135. S. Ray, Zheng, L., and Médard, M., "On Error Probability for Non-coherent MIMO Channels in the Wideband Regime," *ISIT*, pp. 2284-2288, July 2006. **
136. D. Traskov, Ratnakar, N., Koetter, R., D.S. Lun, and Médard, M., "Network Coding for Multiple Unicasts: An Approach based on Linear Optimization," *ISIT*, pp. 1758-1762, July 2006. **
137. F. Zhao and Médard, M., "Online Network Coding for the Dynamic Multicast Problem," *ISIT*, pp. 1753-1757, July 2006. **
138. S. Ray, Moulin, P., and Médard, M., "On Optimal Signaling and Jamming Strategies in Wideband Fading Channels," *IEEE Workshop on Signal Processing Advances in Wireless Communications (SPAWC) 2006*, Cannes, France, pp. 1-5, July 2006. **
139. G. Weichenberg, Chan, V.W.S., and Médard, M., "Cost-Efficient Optical Network Architectures," accepted to the *32nd European Conference on Optical Communication (ECOC)*, Cannes, France, (2 pages), September 2006. **
140. S. Ray, Médard, M., and Zheng, L., "FAWNA: A High-speed Mobile Communication Network Architecture," **invited paper**, *Accessnets*, Article 2 (6 pages), Athens, Greece, September 2006. **
141. J.-S. Park, Lun, D., Gerla, M., and Médard, M., "Performance Evaluation of Network

Publications of Muriel Médard

- Coding in multicast MANET,” *IEEE MILCOM 2006*, Washington, D.C., pp. 1-6, September 2006. **
- 142.S. Katti, Rahul, H., Hu, W., Katabi, D., Médard, M., and Crowcroft, J., “XORs in the Air-Practical Wireless Network Coding,” *Sigcomm Pisa, Italy*, pp. 243-254, September 2006.
- 143.E. Ahmed, Eryilmaz, A., Médard, M., and Ozdaglar, A, “Economic Aspects of Network Coding,” *Allerton Conference*, October 2006**
- 144.S. Ray, Médard, M., and Zheng, L., “On Interface Rate Allocation for a Fiber Aided Wireless Network,” *Asilomar Conference on Signals, Systems and Computers*, pp., 651-655, November 2006. **
- 145.V. Doshi, Shah, D., Médard, M., and Jaggi, S., “Graph coloring and conditional graph entropy,” in *Asilomar Conference on Signals, Systems, and Computers*, 2137-2141, November 2006. **
- 146.V.W.S. Chan, Weichenberg, G., and Médard, M., “Flow Switching,” **invited paper**, *Workshop on Optical Burst Switching (WOBS)*, Paper 1 (8 pages), San Jose, October 2006. **
- 147.G. Weichenberg, Chan, V.W.S., and Médard, M., “On the Throughput-Cost Tradeoff of Multi-Tiered Optical Network Architectures,” *IEEE Global Telecommunications Conference (GLOBECOM)*, pp. 1-6, San Francisco, December 2006. **
- 148.A. Lee, Médard, M., Haigh, K.Z., Gowan, S., and Rubel, P., “Minimum-Cost Subgraphs for Joint Distributed Source and Network Coding,” *Third Workshop on Network Coding, Theory, and Applications*, Paper 7 (4 pages), January 2007. **
- 149.J.-K. Sundararajan, Médard, M., Kim, M., Eryilmaz, A., Shah, D., and Koetter, R., “Network Coding in a Multicast Switch,” *INFOCOM 2007*, pp. 1145-1153, March 2007. **
- 150.S. Jaggi, Langberg, M., Katti, S., Ho, T., Katabi, D., and Médard, M., “Resilient Network Coding In the Presence of Byzantine Adversaries,” *INFOCOM 2007*, pp. 616-624, March 2007.
- 151.M. Kim, Médard, M., Aggarwal, V., O’Reilly, U.-M., Kim, W., Ahn, C.W., and Effros, M., “Evolutionary Approaches to Minimizing Network Coding Resources,” *INFOCOM 2007*, pp. 1991-1995, March 2007. **
- 152.C. Fragouli, Lun, D., Médard, M., and Pakzad, P., “On Feedback for Network Coding,” *Conference on Information Sciences and Systems (CISS)*, Johns Hopkins, (5 pages), March 2007.
- 153.V. Doshi, Shah, D., Médard, M., and Jaggi, S., “Distributed Functional Compression through Graph Coloring,” *Data Compression Conference*, pp. 93-102, paper #8, March 2007. **
- 154.M. Kim, Aggarwal, V., O’Reilly, U.-M., Médard, M., and Kim, W., “Genetic Representations for Evolutionary Minimization of Network Coding Resources,” *EVOComnet 07*, pp. 21-31, April 2007. **
- 155.L. Lima, Médard, M., and Barros, J., “Random Network Coding: A Free Cypher?,” *ISIT* (5 pages), July 2007.
- 156.M. Kim, Sundararajan, J.-K., and Médard, M., “Network Coding for Speedup in Switches,” *ISIT* (5 pages), July 2007. **
- 157.M. Xiao, Médard, M., and Aulin, T., “A Binary Coding Approach for Combination Networks and General Erasure Networks,” *ISIT* (5 pages), July 2007.

Publications of Muriel Médard

158. D. Traskov, Lun, D.S., Koetter, R., and Médard, M., "Network Coding in Wireless Networks with Random Access," *ISIT* (5 pages), July 2007.
159. V. Doshi, Shah, D., and Médard, M., "Source Coding with Distortion through Graph Coloring," *ISIT* (5 pages), July 2007. **
160. F. Zhao, Kalker, T., Médard, M., and Han, K., "Signatures for Content Distribution with Network Coding," *ISIT* (5 pages), July 2007. **
161. S. Katti, Maric, I., Goldsmith, A., Katabi, D., and Médard, M., "Joint Relaying and Network Coding in Wireless Networks," *ISIT* (5 pages), July 2007. **
162. J.-K. Sundararajan, Shah, D., and Médard, M., "On Queueing in Coded Networks - Queue Size Follows Degrees of Freedom," **invited** paper, *Information Theory Workshop*, pp. 212-217, July 2007. **
163. F. Zhao, Lun, D., Médard, M., and Ahmed, E., "Decentralized Algorithms for Operating Coded Wireless Networks," **invited** paper, *Information Theory Workshop* (6 pages), September 2007. **
164. D. Lucani, Médard, M., and Stojanovic, M., "Network Coding Schemes for Underwater Networks: The Benefits of Implicit Acknowledgement," *International Workshop on Under Water Networks* (8 pages), September 2007. **
165. K. Han, Ho, T., Koetter, R., Médard, M., and Zhao, F., "On Network Coding for Security," **invited** paper, *MILCOM* (6 pages), October 2007. **
166. E. Ahmed, Eryilmaz, A., Médard, M., and Ozdaglar, A., "On the Scaling Law of Network Coding Gains in Wireless Networks," *MILCOM* (6 pages), October 2007. **
167. M. Kim, Médard, M., Aggarwal, V., and O'Reilly, U.-M., "On the Coding-Link Cost Tradeoff in Network Coding," *MILCOM* (6 pages), October 2007. **
168. I. Maric, Goldsmith, A., and Médard, M., "Information-Theoretic Relaying for Multicast in Wireless Networks", *MILCOM* (6 pages), October 2007.
169. D. Katabi, Fragouli, C., Markopoulou A., Rahul, H., and Médard, M., "Wireless Network Coding: Opportunities and Challenges", *MILCOM* (6 pages), October 2007.
170. S. Katti, Shintre, S., Jaggi, S., Katabi, D., and Médard, M., "Real Network Codes Breaking the All-Or-Nothing Barrier", *45th Allerton Conference on Communication, Control, and Computing*, October 2007
171. A. ParandehGheibi, Eryilmaz, A. Ozdaglar, A., and Médard, M., "Resource Allocation in Multiple Access Channels," **invited** paper, *Asilomar Conference on Signals, Systems and Computers*, November 2007**
172. A. ParandehGheibi, Eryilmaz, A. Ozdaglar, A., and Médard, M., "Dynamic Rate Allocation in Fading Multiple Access Channels," **invited** paper, *ITA*, January 2008**
173. S. Jing, Zheng, L., and Médard, M., "Layered source-channel coding: a distortion-diversity perspective," **invited** paper, *ITA*, January 2008**
174. B.K. Dey, Katti, S., Jaggi, S., Katabi, D., and Médard, M., "'Real' and 'Complex' Network Codes - Promises and Challenges", *Fourth Workshop on Network Coding Theory and Applications (NETCOD)*, January 2008, pp. 1-6.
175. A. ParandehGheibi, Eryilmaz, A. Ozdaglar, A., and Médard, M., "Rate Allocation in Fading Multiple Access Channel," *WiOpt*, March-April 2008**
176. X. Shi, Lun, D.S., Meldrim, J, Koetter, R., and Médard, M., "Joint Base-calling of Two DNA Sequences with Factor Graphs", *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, March-April 2008, pp. 2049-2052**
177. D. Lucani, Stojanovic, M., and Médard, M., "On the Relationship between Transmission

Publications of Muriel Médard

- Power and Capacity of an Underwater Acoustic Communication Channel”, *OCEANS 08*, April 2008, paper (071201-059)**
178. J.-K. Sundararajan, Shah, D., and Médard, M., “ARQ for Network Coding”, *ISIT 2008*, July 2008**.
179. M. Xiao, Aulin, T., and Médard, M., “Systematic Binary Deterministic Rateless Codes”, *ISIT 2008*, July 2008.
180. S. Katti, Katabi, D., Balakrishnan, H., and Médard, M., “Symbol Level Network Coding for Wireless Mesh Networks”, *Sigcomm*, August 2008
181. A. ParandehGheibi, Eryilmaz, A. Ozdaglar, A., and Médard, M., “Information Theory vs. Queueing Theory for Resource Allocation in Multiple Access Channels”, **invited paper**, *PIMRC*, September 2008**
182. S. Jing, Zheng, L., and Médard, M., “Layered Source-Channel Coding: Towards Unifying Multiple Description and Successive Refinement”, **invited paper**, *Allerton Conference*, October 2008**
183. M. Kim, Médard, M., O’Reilly, U.-M., “Integrating Network Coding into Heterogeneous Wireless Networks”, *MILCOM*, November 2008** (9.3)
184. M. Kim, Médard, M., Barros, J., “Counteracting Byzantine Adversaries with Network Coding: An Overhead Analysis”, *MILCOM*, November 2008** (9.5)
185. D. Lucani, Médard, M., and Stojanovic, M., "A Lower Bound to Transmission Power for Multicast in Underwater Networks using Network Coding", accepted to *ISITA*, December 2008**
186. J.-K. Sundararajan, Shah, D., and Médard, M., “Online Network Coding for Optimal Throughput and Delay – the Three-Receiver Case”, *ISITA*, December 2008**
187. L. Lima, Barros, J., Vilela, J.-P., and Médard, M., “An Information-Theoretic Cryptanalysis of Randomized Network Coding - is Protecting the Code Enough?”, *ISITA*, December 2008
188. D. Traskov, Heindlmaier, M., Médard, M., Koetter, R. and Lun, D.S., “Scheduling for Network Coded Multicast: A Conflict Graph Formulation”, 4th IEEE Workshop on Broadband Wireless Access, December 2008
189. D. Lucani, Médard, M. and Stojanovic, M. , “On Coding for Delay: New Approaches Based on Network Coding in Networks with Large Latency”, **invited paper**, *ITA conference*, February 2009
190. D. Lucani, Médard, M. and Stojanovic, M. , “Random Linear Network Coding for Time Division Duplexing: When to Stop Talking and Start Listening”, *INFOCOM 2009*, April 2009**
191. M. Kim, O’Reilly, U.-M., Médard, M. and Traskov, D., “An Evolutionary Approach To Inter-Session Network Coding”, *INFOCOM 2009*, April 2009**
192. J.-K. Sundararajan, Shah, D., Médard, M., Mitzenmacher, M, Barros, J. “Network Coding Meets TCP”, *INFOCOM 2009*, April 2009**
193. D. Lucani, Médard, M. and Stojanovic, M. , “Random Linear Network Coding For Time Division Duplexing: Energy Analysis”, *ICC Communication Theory Workshop*, June 2009**
194. C. Ng, Médard, M. and Ozdaglar, A., “Completion Time Minimization and Robust Power Control in Wireless Packet Networks”, *ICC Communication Theory Workshop*, June 2009
195. D. Lucani, Médard, M. and Stojanovic, M. , “Completion Time Minimization and Robust Power Control in Wireless Packet Networks”, *ICC Communication Theory Workshop*, June 2009**

Publications of Muriel Médard

196. G. Weichenberg, Chan, V.W.S. and Médard, M., “Performance Analysis of Optical Flow Switching”, *ICC Optical Networks*, June 2009**
197. R. Koetter, Effros, M. and Médard, M., “On a theory of network equivalence”, *Information Theory Workshop*, June 2009
198. D. Lucani, Fitzek, F., Médard, M. and Stojanovic, M., “Network Coding For Data Dissemination: It Is Not What You Know, But What Your Neighbors Don’t Know”, **invited paper**, *RAWNETs*, June 2009**
199. J.-K. Sundararajan, Sadeghi, P. and Médard, M., “A feedback-based adaptive broadcast coding scheme for minimizing in-order delivery delay”, *Netcod*, June 2009**
200. D. Lucani, Médard, M. and Stojanovic, M., “Broadcasting in time-division duplexing: A random linear network coding approach”, *Netcod*, June 2009**
201. M. Kim, Médard, M., Barros, J. and Koetter, R., “An Algebraic Watchdog for Wireless Network Coding”, *ISIT*, July 2009**
202. D. Lucani, Médard, M. and Stojanovic, M., “Random Linear Network Coding for Time-Division Duplexing: Queueing Analysis”, *ISIT*, July 2009**
203. G. Maierbacher, Barros, J., and Médard, M., “Practical Source-Network Decoding”, **invited paper**, *IEEE International Symposium on Wireless Communication Systems*, September 2009
204. S. Feizi and Médard, M., “When Only Sources Need to Compute, On Functional Compression in Tree Networks”, *2009 Annual Allerton Conference on Communication, Control, and Computing*, October 2009**
205. D. Lucani, Médard, M. and Stojanovic, M., “Sharing Information in Time-Division Duplexing Channels: A Network Coding Approach”, *2009 Annual Allerton Conference on Communication, Control, and Computing*, October 2009**
206. M. Langberg and Médard, M., “The Multiple Unicast Network Coding Conjecture”, *2009 Annual Allerton Conference on Communication, Control, and Computing*, October 2009
207. D. Lucani, Médard, M. and Stojanovic, M., “Random Linear Network Coding for Time-Division Duplexing: Field Size Considerations”, *IEEE Globecom 2009 Communication Theory Symposium*, November-December 2009**
208. D. Traskov, Médard, M., Sadeghi, P. and Koetter, R., “Joint Scheduling and Instantaneously Decodable Network Coding”, *IEEE Globecom 2009 Communication Theory Symposium*, November-December 2009
209. S. Feizi, and Médard, M., “Multi-Functional Compression with Side Information”, *IEEE Globecom 2009 Communication Theory Symposium*, November-December 2009**
210. I. Maric, Goldsmith, A., and Médard, M., “Analog Network Coding in the High SNR Regime”, **invited paper**, *ITA Workshop*, January 2010
211. F. Zhao and Médard, M. “On analyzing and improving COPE performance”, **invited paper**, *ITA Workshop*, January 2010**
212. S. Huang, Ramamoorthy, A., and Médard, M., “Minimum cost content distribution using network coding: Replication vs. coding at the source nodes”, *ITW 2010*
213. M.-J. Montpetit and Médard, M., “Video-centric Network Coding Strategies for 4G Wireless Networks: An Overview”, *2010 IEEE Consumer Communications and Networking Conference*.
214. R. S. Thinniyam, Kim, M., Médard, M., O'Reilly, U.-M., “Network Coding in Optical Networks with O/E/O Based Wavelength Conversion”, *OFC 2010***
215. D. Traskov, Lenz, J., Ratnakar, N. and Médard, M., “Asynchronous Network Coded

Publications of Muriel Médard

- Multicast”, *2010 ICC Communication Theory Symposium*
216. A. ParandehGheibi, Ozdaglar, A., Effros, M. and Médard, M., “Optimal Reverse Carpooling Over Wireless Networks - A Distributed Optimization Approach”, *CISS 2010***
 217. M. Kim, Lucani, D., Shi, X., Zhao, F. and Médard, M., “Network coding for multi-resolution multicast”, *INFOCOM 2010***
 218. I. Maric, Goldsmith, A. and Médard, M., “Analog Network Coding in the High-SNR Regime”, *IEEE Wireless Network Coding Workshop 2010*
 219. A. ParandehGheibi, Sundararajan J.-K. and Médard, M., “Collision Helps - Algebraic Collision Recovery for Wireless Erasure Networks”, *IEEE Wireless Network Coding Workshop 2010***
 220. C. Chang, Effros, M., Ho, T., Médard, M. and Leong, B., “Issues in Peer-to-Peer Networking: a Coding Optimization Approach”, *NETCOD 2010*
 221. N. Fawaz and Médard, M., “On the Non-Coherent Wideband Multipath Fading Relay Channel”, *ISIT 2010*
 222. D. Lucani, Médard, M. and Stojanovic, M., “Systematic Network Coding for Time-Division Duplexing”, *ISIT 2010***
 223. A. ParandehGheibi, Médard, M., Shakkottai, S. and Ozdaglar, A., “Avoiding Interruptions - QoE Trade-offs in Block-coded Streaming Media Application”, *ISIT 2010***
 224. W.-Y. Shin, Lucani, D., Médard, M., Stojanovic, M. and Tarokh, V., “Multi-hop Routing is Order-optimal in Underwater Extended Networks”, *ISIT 2010*
 225. S. Feizi and Médard, M., “Some Cases Where Finding the Minimum Entropy Coloring of a Characteristic Graph is a Polynomial Time Problem”, *ISIT 2010***
 226. M. Kim, Médard, M. and Barros, J., “A Multi-Hop Multi-Source Algebraic Watchdog”, *ITW*, August 2010**
 227. M. Kim and Médard, M., “Algebraic Network Coding Approach to Deterministic Wireless Relay Network”, *Allerton Conference*, October 2010**
 228. S. Feizi, Goyal, V.K. and Médard, M., “Locally Adaptive Sampling”, *Allerton Conference*, October 2010**
 229. S. Feizi, Médard, M. and Effros, M., “Compressive Sensing over Networks”, *Allerton Conference*, October 2010**
 230. A. ParandehGheibi, Sundararajan, J.-K. and Médard, M., “Acknowledgement Design for Collision-Recovery-Enabled Wireless Erasure Networks””, *Allerton Conference*, October 2010**
 231. A. Rezaee, Zeger, L. and Médard, M., “Multi Packet Reception and Network Coding”, *MILCOM 2010*, November 2010**
 232. P. Oliveira, Lima, L., Vinhoza, T. T., Barros, J. and Médard, M., “Trusted Storage over Untrusted Networks”, *IEEE Globecom 2010 - Communication Theory Symposium*
 233. M. Thakur and Médard, M., “On optimizing low SNR wireless networks using network coding””, accepted to *IEEE Globecom 2010 - Communication Theory Symposium*
 234. D. Lucani, Médard, M. and Stojanovic, M., “Online Network Coding for Time-Division Duplexing”, *IEEE Globecom 2010 - Symposium on Selected Areas in Communications***
 235. J. Heide, Pedersen, M., Fitzek, F., and Médard, M., “On Code Parameters and Coding Vector Representation for Practical RLNC”, *ICC Communication Theory Workshop 2011*
 236. M. Heindlmaier, Lun, D. S., Traskov, D., and Médard, M., “Wireless Inter-Session

Publications of Muriel Médard

Network Coding – An Approach Using Virtual Multicasts”, *ICC Communication Theory Workshop 2011*

237. M. Thakur, Fawaz, N., and Médard, M., “Optimal relay location and power allocation for low SNR broadcast relay channels”, *INFOCOM 2011*
238. M. Kim, Médard, M., and Barros, J., “Modeling Network Coded TCP Throughput: A Simple Model and its Validation”, *Valuetools 2011***
239. M. Thakur, N. Fawaz, and Médard, M., “On the geometry of wireless network multicast in 2-D”, accepted to *ISIT 2011*
240. B. Haeupler and Médard, M., “One Packet Suffices - Highly Efficient Packetized Network Coding With Finite Memory”, accepted to *ISIT 2011***
241. A. Kim and Médard, M., “Computing Bounds on Network Capacity Regions as a Polytope Reconstruction Problem”, accepted to *ISIT 2011***
242. W. Guo, Cai, N., Shi, S., and Médard, M., “Localized Dimension Growth in Random Network Coding: A Convolutional Approach”, accepted to *ISIT 2011***

1. Other publications:

1. Book Chapter: M. Médard and Lumetta, S.S., “Network Reliability and Fault Tolerance,” *Wiley Encyclopedia of Engineering*, Editor: J.G. Proakis.
2. Book Chapter: D.S. Lun, Ho, T., Ratnakar, N., Koetter, R., and Médard, M., “Network Coding in Wireless Networks -A survey of techniques for efficient operation of coded wireless packet networks,” *Cooperation in Wireless Communications: Principles and Applications*, Springer, Editors: F. Fitzek and M. Katz, 2007.
3. Book Chapter: F. Zhao, Médard, M., Lun, D.S., and Ozdaglar, A., “Minimum Cost Subgraph Algorithms for Static and Dynamic Multicasts with Network Coding”, *Directions in Wireless Communications*, Springer, Editor: Vahid Tarokh, 2009.
4. Book to appear: M. Médard and Sprintson, A. (editors), “Network Coding: Fundamentals and Applications”, AP, Elsevier

2. Internal Memoranda:

1. H. Wang, Modiano, E., and Médard, M., “Partial Path Protection for WDM Networks-End-to-end Recovery using Local Failure Information,” Technical Report LIDS-2517, September 2001.
2. D.S. Lun, Médard, M., Ho, T., and Koetter, R., “Network Coding with a Cost Criterion,” Technical Report LIDS-P-2584, April 2004.
3. J.K. Sundararajan, Zhao, F., Youssef-Massaad, P.G., and Médard, M., “A Modification to RED AQM for CIOQ Switches,” Technical Report LIDS-2585, April 2004.
4. J. K. Sundararajan, Deb, S., and Médard, M., “To Copy or not to Copy: Extending the Birkhoff-von Neumann Switching Strategy to Multicast S,” Technical Report LIDS-2624, August. 2004.
5. D. S. Lun, Ratnakar, N., Koetter, R., Médard, M., Ahmed, E., and Lee, H., “Achieving Minimum Cost Multicast: A Decentralized Approach Based on Network Coding,” Technical Report LIDS-P-2629, September 2004.
6. G. Weichenberg, Chan, V.W.S., and Médard, M., “On the Capacity of Optical Networks: A Framework for Comparing Different Transport Architectures,” Technical Report LIDS-P-2655, MIT LIDS, July 1 2005.

Publications of Muriel Médard

7. S. Jaggi, Langberg, M., Katti, S., Ho, T., Katabi, D., and Médard, M., “Resilient Network Coding in the Presence of Byzantine Adversaries”, MIT-CSAIL-TR-2006-053, August 1, 2006
3. Invited Lectures:
 - Spring 1997 “Optical Network Security,” Steering Committee Lecture, MIT Lincoln Laboratory
 - Fall 1997 “Spreading and Recovery: topics in communications,” **invited** seminar, University of California, Berkeley
 - Fall 1997 “Topics in Communications,” **invited** seminar, University of Illinois Urbana-Champaign
 - Spring 1998 “Topics in Optical Network Security,” **invited** seminar, University of Maryland and MIT
 - Spring 1998 “Security in Optical Networks,” **invited** seminar, Rensselaer Polytechnic Institute
 - Fall 1998 “Restoration in Optical Networks,” Coordinated Science Laboratory (CSL) Seminar, University of Illinois, Urbana-Champaign
 - Fall 1998 “Spreading in Time-varying Channels,” **invited** seminar, University of Michigan
 - Spring 1999 “Capacity of Time-varying Channels with Side Information,” **invited** seminar, University of Michigan and MIT
 - Summer 1999 “Capacity of Time-varying Channels with Side Information,” **invited** seminar, Northwestern University
 - Fall 1999 “An Overview of Security for Optical Networks,” Coordinated Science Laboratory (CSL) Seminar, University of Illinois Urbana-Champaign
 - Fall 1999 “Capacity of Fast Time-varying Channels with Side Information,” Coordinated Science Laboratory (CSL) Seminar, University of Illinois Urbana-Champaign
 - Fall 2000 “Restoration in Optical Networks,” **invited** seminar, Carnegie-Mellon University
 - Spring 2001 M. Médard, “Robustness and Recovery in Optical Networks,” **invited** presentation, *IEEE Gigabit Networking Workshop*, also **invited** seminar, George Washington University
 - May 2001 “Some different aspects of adaptive coding for wireless communications,” **invited** seminar, Stanford University and **invited** seminar, Lucent Bell Labs (June 2001)
 - June 2001, “Robust Optical Communications,” **invited** seminar, Lucent Bell Labs
 - May 2001 and August 2001 “Robustness and Security in Optical Networks,” presentation for AFOSR URI kickoff at Stanford University and AFOSR program review at Wright-Patterson Air Force Base
 - October 2001 “Some New Directions in Communications and Networking,” **invited** tutorial, Federal Communications Commission
 - December 2001, “Network Coding for Capacity and Robustness,” **invited** talk at the DIMACS (Center for Discrete Mathematics and Theoretical Computer Science at Rutgers University) Workshop on Codes and Complexity
 - December 2001, “Optical Network Security,” **invited** talk to the DARPA Information Assurance for Optical Networks (OpticIA) Workshop

Publications of Muriel Médard

March 2002, “When the Physical Layer Matters -a perspective on networking aspects of wireless communications,” **invited** talk, Information Science and Technology (ISAT) study group for DARPA on “Robust Networks for Critical Missions and Critical Infrastructure”

April 2002, “Some Aspects of Robustness in Wireless Networks,” **invited** seminar, University of Massachusetts, Amherst

June 2002, “Overview of New Results in Optical Access Networks Robustness,” **invited** Photonics Series seminar at the University of Illinois Urbana-Champaign

October 2002, M. Médard and Kim, M., “A Bound on Backup Path Lengths Using a Random Graph Approach,” **invited** paper, IEEE Annual Computer Communications Workshop, 2002

October 2002, “Network Coding and Network Management-Towards Fundamental Limits?” **invited** seminar, Cornell University, also **invited** seminar, Boston University

November 2002, “Security in Optical Networks,” **invited** briefing to the Assistant Secretary of Defense (C3I) (Highland Forum), at the Pentagon (Washington, D.C.)

Spring 2003, “Network Coding: Towards an Unified View of Routing, Network Management, Coding and Compression?” **invited** seminar, Applied Mathematics Department, Brown University, also **invited** seminar, ECE Department, Georgia Tech, also **invited** IBM Lecture, Notre Dame University

Fall 2004, “Network Coding: Towards an Unified View of Routing, Recovery, Coding and Compression?” **invited** seminar, Harvard University

Spring 2004, “Coding for Networks,” **invited** presentation, the Annual Lee Center Workshop (Caltech's Lee Center for Advanced Networking), in which 4 guest speakers present to Caltech faculty, students and alumni

May 2004, D.S. Lun, M. Médard, T. Ho, Koetter, R., “Network Coding with a Cost Criterion,” **invited** talk, Communication Theory Workshop

May 2004, “Network Coding: an Introduction,” a one-day course given to the Centre for Wireless Communications at the University of Oulu, Finland (co-taught with Ralf Koetter of UIUC)

August 2004, “Towards a Random, Distributed Operation of Networks,” **invited** presentation, Lucent Bell Labs, also Colloquium, Northeastern University, October 2004

October 2004, “Byzantine Modification Detection in Multicast Networks Using Randomized Network Coding,” **invited** seminar, Northeastern University

October 2004, “On the Implications of Optical Splitting for Multicasting,” **invited** presentation, 19th IEEE Annual Computer Communications Workshop

December 2004, “Network Coding,” one-day tutorial at the IEEE Global Telecommunications Conference (Globecom) (co-taught with Ralf Koetter of UIUC and Phil Chou of Microsoft)

January 2005, “An Overview of the Use of Distributed Mechanisms in Network Coding,” **invited** presentation, DIMACS (Center for Discrete Mathematics and Theoretical Computer Science at Rutgers University) Workshop on Network Coding

April 2005. “Network Coding for Cost, Reliability and Ease of Management,” **invited** seminar, Yale University

June 2005, “Network Coding in Wireless Networks,” **Plenary Speaker**, IEEE Workshop on Signal Processing Advances in Wireless Communications (SPAWC), New York

June 2005, “Network Coding -an Introduction,” **invited** seminar, Seminaire Euronetlab,

Publications of Muriel Médard

Universite Pierre et Marie Curie, Paris

June 2005 “Network Coding for Cost, Reliability and Ease of Management,” **invited** seminar, Ecole Nationale Supérieure de Telecommunications de Bretagne, also Joint IEEE Comsoc & IT-Lab Conference on Communications and Coding, **invited** seminar, ENST Paris, June 2005, also **invited** seminar, Ecole Polytechnique Federale de Lausanne, July 2005

September 2005, “On Distributed Optimization for Networks,” **Keynote Speaker**, Mobile Information and Communications Systems Scientific Conference, Loewenberg, Switzerland

September 2005, “Network Coding,” one-day tutorial at the IEEE International Symposium on Information Theory (co-taught with Ralf Koetter of UIUC and Phil Chou of Microsoft)

December 2005, “Wireless Network Coding,” Signal Processing/ Communications **invited** seminar, University of California at Los Angeles

April 2006, “Wireless Network Coding,” **invited** seminar, University of Texas at Austin,

May 2006, “Network Coding-Where to Now?” **Plenary Speaker**, IFIP Networking 2006, also **invited** seminar, May 2006, University of Porto, Portugal

June 2006, “Network Coding-An Overview,” **invited** seminar, Ecole Nationale Supérieure de Télécommunications de Bretagne, Rennes

June 2006, “Distributed Network Coding for Sensor Networks,” **tutorial**, International Workshop on Wireless and Ad Hoc Networks 2006

August 2006, “Network Coding: A Tutorial,” **tutorial**, University of California at San Diego, ITA Center (co-taught with Ralf Koetter of UIUC)

August 2006, “Network Coding for Wireless Networks,” **invited** seminar, University of Southern California

March 2007, “Network Coding-an Optimization View,” **Plenary Speaker**, Conference on Information Sciences and Systems, Johns Hopkins University, also April 2007 **General Dynamics Distinguished Lecture Series**, University of Michigan and **invited** seminar Intel Workshop on Wireless Communications (last two cancelled because of sickness)

May 2007, “Some Interesting Directions in Network Coding,” **invited** presentation, workshop on Algorithms, Inference and Statistical Physics, Santa Fe, NM, organized by the Los Alamos National Laboratory and the Center for Nonlinear Studies

May 2007, “Introduction to Network Coding,” **tutorial**, IFIP Networking 2007, Atlanta, Georgia, also Workshop on Network Coding, Hong Kong, January 2008

May 2007, “On Security Aspects of Network Coding,” **invited** talk, IEEE Communications Theory Workshop, Sedona, Arizona

September 2007, “Le codage sur réseaux - théorie, applications et nouvelles frontières”, **Plenary Speaker**, GRETSI 2007, Troyes, France

September 2007, “New Directions in Wireless Communications,” **Gilbreth Lecture** to the National Academy of Engineering

January 2008, “On Theory and Practice in Network Coding”, **Keynote Lecture**, Coordinated Science Laboratory at UIUC 3rd annual Student Conference in the areas of Control, Communications and Signal Processing.

February 2008, “Delay and throughput in network coding”, **invited** seminar, Iowa State University

June 2008, “Network Coding”, **invited** course, First School of Information Theory,

Publications of Muriel Médard

organized by the IEEE Information Theory Society at Penn State

June 2008, “Network coding and security”, **Keynote Address**, IEEE Workshop on Wireless Network Coding, San Francisco

June 2008, “An Introduction to Network Coding”, short course given at Bretagne Telecom, France

June 2008, “Le codage sur réseaux – principes et applications”, **invited** lecture, at the PRACOM conference, Bretagne Telecom, France

September 2008, “Introduction to Network Coding”, tutorial at the IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC) 2008, Cannes, France, co-taught with Ralf Koetter of TUM

September 2008, “How to Get There from Here”, presentation to the Networking Networking (N²) Women Forum, Cannes, France

September 2008, “On the intersection between queueing and information theory - some new results”, **invited** seminar at Eurecom, France, **invited** seminar, University of Illinois, Chicago (November 2008), **invited** seminar, Harvard (February 2009), **invited** seminar, University of California San Diego (April 2009), **invited** seminar, Ohio State University (May 2009), **invited** seminar at KAIST, Korea (July 2009), **invited** seminar at CTTC under Catalonia’s Invited Lectureship Program, Barcelona, Spain (July 2009)

May 2009, “On the Confluence of Information Theory and Networking”, **Plenary Lecture**, Conftele, Portugal

May 2009, “Network coding and security - new paradigms”, **Keynote Address**, European Wireless Conference, Aalborg, Denmark

May 2009, “Network coding”, tutorial, Muriel Médard, Joerg Widmer and Frank H.P. Fitzek, European Wireless Conference, Aalborg, Denmark

September 2009, “Bringing network coding into the network”, **Keynote Address**, International Teletraffic Conference, Paris, France

January 2010, “Some New(ish) Results in Information Theory”, **invited lecture**, Programme on New Topics at the Interface Between Probability and Communications, Newton Institute for Mathematics, Cambridge, UK

January 2010, “Bringing Network Coding into the Network”, **invited lecture**, Computer Laboratory Systems Research Group Seminar, Cambridge, UK, **invited lecture**,

February 2010, “Some New Directions in Information Theory”, **invited lecture**, Workshop on Frontiers of Controls, Games, and Network Science with Civilian and Military Applications, Austin, TX

May 2010, “On the practice of network coding. Bringing network coding into the network.” **Keynote Lecture**, 5th IEEE International Symposium on Wireless Pervasive Computing, Modena, Italy

July 2010, “When network coding met the network”, **Keynote Lecture**, International Conference on Infocomm Technology, Hanan, China

July 2010, “Some Perspectives on Scaling”, **Plenary Presentation**, JTEN, MIT Lincoln Laboratory

Publications of Muriel Médard

November 2010, “Some New Directions for Network Coding in Content Distribution”,
invited lecture, Alcatel-Lucent

Theses Supervised by Muriel Medard

Summary

	Total	Completed	In Progress
Bachelor	0	0	0
Master of Engineering	10	9	1
Master of Science	22	17	5
Engineer	0	0	0
Doctoral			
As Supervisor	18	12	6
As Reader	34	33	1

Bachelor's Theses

None

Master's of Engineering Theses

Zheng, Changqing, "Optimum Spreading Bandwidth for DS-CDMA on Time and Frequency Fading Channels," May 2002

Rettig, Pascal, "Transmit Simulation and Receive Optimization for 802.11b Networks" (6-A student at Qualcomm), May 2002

Le Cocq, Cécile, "Delay Improvements from Multiple Wavelengths in an Optical Folded Bus," September 2003

Choute, Clifford, "Performance of Random Network Coding for Data Dissemination," (co-supervised with Supratim Deb), June 2005

Lee, Anna, "Simplified Random Network Codes for Multicast Networks," June 2005

Tang, Jianlong, "Secure Network Coding with a Cost Criterion," June 2006

Ebad Ahmed, "Economic Aspects of Network Coding", (co-supervised with Asuman Ozdaglar and Atilla Eryilmaz), June 2007

Minji Kim, "Network Coding for Speed-up in Switches," August 2007

Kim, Anthony, "On Network Coding Capacity - Matroidal Networks and Network Capacity Region", September 2010 (co-supervised with Una-May O'Reilly)

Urbina, Leonardo, "Network Coding with Heterogeneous Networks"

Master's Theses

Saengudomlert, Poompat, "Analysis and Detection of Jamming Attacks in an All-optical Network," June 1998 (co-supervised with Robert G. Gallager)

Huang, Jianyi, "Capacity of Time-slotted ALOHA Systems," June 2000, University of Illinois

Theses Supervised by Muriel Medard

Urbana-Champaign (co-supervised with Sean P. Meyn)

He, Wenbo, “Heuristic Algorithms for Failure Recovery in Mesh Networks,” August 2000, University of Illinois Urbana-Champaign

Wang, Hung Jen, “Routing Policy on Robustness in Optical Networks,” March 2002 (co-supervised with Eytan Modiano)

Libarikian, Ari, “Robustness of Bus Overlays in Optical Networks,” April 2002, **winner of a MIT Masterworks (one of 9 in EECS)**

Coleman, Todd, “Trade-off Between Power Consumption and Delay in Wireless Packetized Systems,” April 2002, **winner of the Morris J. Levin Award (First Prize) at the MIT Masterworks**

Lun, Desmond, “Error Exponent for Multipath Fading Channels: Strong Coding Theorem,” September 2002 (co-supervised with Ibrahim Abou-Fayçal)

Weichenberg, Guy, “High-Reliability Architectures for Networks Under Stress,” June 2003 (co-supervised with Vincent Chan)

Kim, Minkyu, “Robustness in Large-Scale Random Networks,” June 2003

Ray, Siddharth, “Achievable Rates Over Bursty Multiple-Access Noise-Free Channels,” September 2003 (co-supervised with Jinane Abounadi)

Youssef-Massaad, Pamela, “Impact of processing energy on the capacity of wireless channels,” started Fall 2003 (co-supervised with Lizhong Zheng)

Sundararajan, Jay Kumar, “Extending the Birkhoff-von Neumann Switching Strategy to Multicast Switching” June 2005 (co-supervised with Supratim Deb), **winner of a Morris J. Levin Award at the MIT Masterworks**

Jing, Sheng, “On Sounding in Wideband Channels,” June 2006, (co-supervised with Lizhong Zheng)

Doshi, Vishal, “Functional Compression: Theory and Applications”, February 2008 (co-supervised with Devavrat Shah)

ParandehGhebi, Ali, “Fair Resource Allocation in Multiple Access Channels”, June 2008 (co-supervised with Asuman Ozdaglar)

Shi, Shirley, “Joint Base-Calling of Two DNA Sequences with Factor Graphs”, September 2009 (co-supervised with Desmond Lun from the Broad Institute)

Feizi-Khankandi, Soheil, “Network Functional Compression”, June 2010

Jason Cloud, started September 2009

Arman Rezaee, started September 2009

Weifei Zeng, started January 2010

Theses Supervised by Muriel Medard

Georgios Angelopoulos, started February 2010 (co-supervised with Anantha Chandrakasan)

Tong (Ada) Wang, started September 2010

Engineers Theses

None

Doctoral Theses, Supervisor

Ho, Tracey, “Networking from a Network Coding Perspective,” May 2004. Committee: David Karger, Ralf Koetter (UIUC), Michelle Effros (Caltech) (**received an Honorable Mention from the George M. Sprowls Award for the best doctoral theses in computer science**)

Peranginangin, Nathanael, “On Capacity of Relay Networks with Finite Memory Relays,” September 2004. Committee: Robert G. Gallager, Ralf Koetter (UIUC), Vincent Chan.

Luo, Cheng, “Communication for Wideband Fading Channels: on Theory and Practice,” (co-supervised with Lizhong Zheng), October 2005. Committee: Greg Wornell, Vincent Chan, Dennis Goeckel (University of Massachusetts Amherst).

Coleman, Todd, “Low-Complexity Approaches to Distributed Data Dissemination,” November 2005. Committee: John Tsitsiklis, Ralf Koetter (UIUC), Michelle Effros (Caltech), Andrea Goldsmith (Stanford).

Lun, Desmond, “Efficient Operation of Coded Packet Networks,” June 2006. Committee: John Tsitsiklis, Ralf Koetter (UIUC), Michelle Effros (Caltech).

Ray, Siddharth, “Energy-Efficient Multiple Antenna Communication”, (co-supervised with Lizhong Zheng), August 2006. Committee: Pierre Moulin (UIUC), Pramod Viswanath (UIUC).

Kim, Minkyu, “Evolutionary Approaches Toward Practical Network Coding (co-supervised with Una-May O’Reilly), September 2008. Committee: Michelle Effros (Caltech).

Weichenberg, Guy, “Design and Analysis of Optical Flow Switched Networks” (co-supervised with Vincent Chan), January 2009. Committee: Eric Swanson.

Sundararajan, Jay-Kumar, “On the Role of Feedback in Network Coding”, (co-supervised with Devavrat Shah), August 2009. Committee: Michel Goemans.

Sheng, Jing, “Towards Unifying Multi-Resolution and Multi-Description - A Distortion-Diversity Perspective”, September 2009, (co-supervised with Lizhong Zheng)

Zhao, Fang, “Distributed Control of Coded Networks”, October 2009. Committee: Asuman Ozdaglar and Desmond Lun.

Lucani, Daniel, “Network Coding for Delay Challenged Environments” (co-supervised with Milica Stojanovic (Northeastern University)), March 2010. Committee: Vincent Chan.

Kim, Minji, started Fall 2007

Shirley Shi, started Fall 2008

Theses Supervised by Muriel Medard

Flavio Calmon du Pin, started Fall 2009

Ali ParandehGheibi, started Fall 2008 (co-supervised with Asu Ozdaglar)

Soheil Feizi, started Summer 2010

Ulric Ferner, started Summer 2010

Doctoral Theses, Reader

Visotsky, Yevgeny, "Space-time Transmit Precoding and Interference Suppression for a Wireless Downlink," June 2000 (supervised by Upamanyu Madhow), University of Illinois Urbana-Champaign

Abou-Fayçal, Ibrahim, "An Information Theoretic Study of Reduced Complexity Receivers for Intersymbol Interference Channels," January 2001 (supervised by Amos Lapidot)

Yeh, Edmund, "Successive Decoding in Multiple-user Communications," June 2001 (supervised by Robert G. Gallager)

Klein, Thierry, "Capacity of Gaussian Noise Channels with Side Information and Feedback," June 2001 (supervised by Robert G. Gallager)

Laneman, Nicholas, "Cooperative Diversity in Wireless Networks: Algorithms and Devices," July 2002 (supervised by Greg Wornell)

Roy, Sandip, "Moment Linear Stochastic Systems and Their Applications," June 2003 (supervised by George Verghese)

Yao, Huan, "Efficient Signal, Code, and Receiver Designs for MIMO Communication Systems," June 2003 (supervised by Greg Wornell)

Min, Rex, "Energy and Quality Scalable Wireless Communication," June 2003 (supervised by Anantha Chandrakasan)

Shulman, Nadav, "Communication over an Unknown Channel via Common Broadcasting," July 2003 (supervised by Meier Feder), Tel Aviv University

De Couto, Douglas, "High-Throughput Routing for Multi-Hop Wireless Networks," May 2004 (supervised by Robert Morris)

Huang, Jianyi, "Characterization and Computation of Optimal Distributions for Channel Coding," August 2004 (supervised by Sean Meyn), University of Illinois Urbana-Champaign

Wu, Xin Zhou, "Wireless Communications in the Energy-Limited Regime," October 2004 (supervised by R. Srikant), University of Illinois Urbana-Champaign

Rasala-Lehman, April, "Network Coding," January 2005 (supervised by Madhu Sudan)

Gentry, Sommer, "Dancing Cheek to Cheek: Haptic Communication between Partner Dancers and Swing as a Finite State Machine," June 2005 (supervised by Eric Feron)

Chen, Li-Wei, "A Study on the Tradeoff between Efficient Resource Allocation and Node Complexity in WDM Optical Networks," August 2005 (supervised by Eytan Modiano)

Theses Supervised by Muriel Medard

- Jaggi, Siddharth, “Design and Analysis of Network Codes,” November 2005 (supervised by Michelle Effros), California Institute of Technology
- Khalili, Ramin, “On the Properties of the Packet Layer Transmission,” December 2005 (supervised by Kaveh Salamatian), Université Pierre et Marie Curie, France
- Sicot, Guillaume, “Etude du codage dans l’ADN,” June 2006 (supervised by Ramesh Pyndiah), l’Ecole Nationale Supérieure de Télécommunications de Bretagne, France
- Sethuraman, Vignesh, “On Non-Coherent Communication over Correlated Fading Channels with Practical Power Constraints,” July 2006 (supervised by Bruce Hajek), University of Illinois Urbana-Champaign
- Ratnakar, Narajan, “On Joint Resource Allocation and Network Coding in Networks of Point to Point Links and on Multicasting in Aref Networks”, August 2006 (supervised by Ralf Koetter), University of Illinois Urbana-Champaign
- Miliou, Natalia, “On Error Exponents for Fading Channels and Network Coding for Wireless Networks,” April 2007 (supervised by Amos Lapidoth), ETH Zurich, Switzerland
- Piantanida, Pablo, “Multi-User Information Theory: State Information and Imperfect Channel Knowledge,” May 2007 (supervised by Pierre Duhamel), University of Paris-Sud XI (Supélec), France
- Edalat, Farinaz, “Real-time Sub-carrier Adaptive Modulation and Coding in Wideband Orthogonal Frequency Division Multiplexing Wireless Systems”, December 2007 (supervised by Charles Sodini)
- Wen, Yonggang, “Efficient Fault Management Architecture for Cost-Optimized Dynamic All-Optical Networks: A Systematic Approach”, December 2007 (supervised by Vincent W.S. Chan)
- Katti, Sachin, “Network Coded Wireless Architecture”, September 2008 (supervised by Dina Katabi)
- Chirawat Kotcharsan, “Robust Joint Transmitter and Receiver Power Allocation for Multi-user Communications”, July 2008 (supervised by Poompat Saengulomlert), Asian Institute of Technology, Thailand
- Fawaz, Nadia, “Cooperative Communications for Wireless Ad Hoc Networks”, December 2008 (supervised by Mérouane Debbah and David Gesbert), Eurecom/ Supélec, France
- Sundaram, Shreyas, “Linear Iterative Strategies for Information Dissemination and Processing in Distributed Systems”, April 2009 (supervised by Chris Hadjicostis), University of Illinois Urbana-Champaign
- Kim, Sang Joon, “Performance bounds for bi-directional relaying protocols”, April 2009 (supervised by Vahid Tarokh), Harvard
- Kabat, Andrzej (supervised by Ramesh Pyndiah), “Contributions au Codage Correcteur d’Erreurs: Décodage Pondéré des Codes de Reed-Solomon et Codage Distribué pour les Communications Coopératives Sans Fil”, Bretagne Télécom, France
- Mahmino, Ali (supervised by Jerome Lacan), “Applications du Codage Réseau aux Architectures aux Garanties de Qualité de Service (QoS)”, February 2010, Université de

Theses Supervised by Muriel Medard

Toulouse, France

Tirronen, Tuomas (supervised by Jorma Vitarmo), “Fountain Codes: Performance Analysis and Optimisation”, March 2010, Helsinki University of Technology

Traskov, Danail (supervised by the later Ralf Koetter, later by Professor Hanik), “Network Coding for Multiple Access”, October 2010, Technical University of Munich

Lima, Luisa (supervised by Joao Barros), “Network Coding Security Algebraic Properties and Lightweight Solutions”, December 2010, University of Porto

Dan-Cristian Tomozei.

Postdoctoral Fellows Supervised by Muriel Medard

Postdoctoral Fellows Supervised

Current Postdocs

<u>Name</u>	<u>Dates of Appointment</u>	<u>PhD Granting Institution</u>	<u>Current Position</u>
Nadia Fawaz	January 2009	Supelec	

Previous Postdocs

<u>Name</u>	<u>Current Title</u>	<u>Current Employer</u>
Lucille Sasatelli	Assistant Professor	Eurecom
Chris Ng	Member of Tech. Staff	Alcatel Lucent Bell Labs
Atilla Eryilmaz	Asst. Professor	Ohio State University
Siddarth Jaggi	Asst. Professor	Chinese University of Hong Kong
Supratim Deb	Member of Tech. Staff	Alcatel Lucent Bell Labs, India
Ibrahim Abou-Fayçal	Asst. Professor	American Univ. of Beirut