

## PUBLICATIONS

**Robert J. McEliece**  
(last revision August 15, 2002)

1. “Codes with Bounded Synchronization Delay” (with S. Golomb), *JPL Space Programs Summary* 37-23, vol. IV (1963), pp. 146–149.
2. “Optimal Communication Nets,” *JPL Space Programs Summary* 37-29, vol. IV (1964), pp. 221–227.
3. “Lattice Structure of Codes over Binary Asymmetric Channels,” *JPL Space Programs Summary* 37-29, vol. IV (1964), pp. 308–310.
4. “Weights of Cyclic Codes” (with G. Solomon), *J. Comb. Theory* 1 (1966), pp. 459–475.
5. “A Combinatorial Identity in Order Statistics,” *JPL Space Programs Summary* 37-39, vol. IV (1966), pp. 230–231.
6. “Efficient Solutions of Equations for Decoding,” *JPL Space Programs Summary* 37-40, vol. IV (1966), pp. 216–218.
7. “A Class of Two-Weight Codes,” *JPL Space Programs Summary* 37-41, vol. IV (1966), pp. 264–266.
8. “A Generalization of Difference Sets,” *Can. J. Math.* 19 (1967), pp. 206–211.
9. **Linear Recurring Sequences Over Finite Fields**, Ph.D. Thesis, Caltech, March 1967.
10. “On the Number of Information Bits in Certain Cyclic Codes,” *JPL Space Programs Summary* 37-44, vol. IV (1967), pp. 291–293.
11. “Weights of Cyclic Codes,” *Proc. First Hawaii International Conference on System Sciences*, (1968), pp. 162–165.
12. “A Note on Reed-Solomon Codes,” *JPL Space Programs Summary* 37-49, vol. III (1968), pp. 310–311.
13. “Capabilities of Convolutional Codes” (with Howard Rumsey Jr.), *JPL Space Programs Summary* 37-50, vol. III (1968), pp. 248–251.
14. “Cross-Correlation of Reverse Maximal-Length Shift Register Sequences” (with T. Dowling), *JPL Space Programs Summary* 37-53, vol. III (1968), pp. 192–193.

15. "Sphere-Packings in the Hamming Metric" (with Howard Rumsey Jr.), *Bull. American Math. Soc.*, 75 (1969), pp. 32–34.
16. "Factorization of Polynomials Over Finite Fields," *Math. Comp.* 23 (1969), pp. 861–868.
17. "Cyclic Codes and Exponential Sums," *Proc. Second Hawaii International Conference on System Sciences*, (1969), pp. 223–225.
18. "The Synchronization of Reed-Solomon Codes," *JPL Space Programs Summary* 37-55, vol. III (1969), pp. 38–41.
19. "Quadratic Forms Over Finite Fields and Second-Order Reed-Muller Codes," *JPL Space Programs Summary* 37-58, vol. III (1969), pp. 28–33.
20. "On the Symmetry of Good Nonlinear Codes," *IEEE Trans. Inform. Theory* IT-16 (1970), pp. 609–611.
21. "Error-Correcting Prefixes for Establishing Word Synchronization," *JPL Space Programs Summary* 37-61, vol. III (1970), pp. 48–50.
22. "Some Results on the Capacity of Graphs" (with R. P. Stanley and H. Taylor), *JPL Space Programs Summary* 37-61, vol. III (1970), pp. 51–54.
23. "An Upper Bound on the Free Distance of a Tree Code" (with J. Layland), *JPL Space Programs Summary* 37-62, vol. III (1970), pp. 63–64.
24. "On Periodic Sequences from  $GF(q)$ ," *J. Comb. Theory Series A*, 10 (1971), pp. 80–91.
25. "Ramsey Bounds for Graph Products" (with Paul Erdős and Herbert Taylor), *Pac. J. Math.* 37 (1971), pp. 45–46.
26. "Hide and Seek, Data Storage, and Entropy" (with Edward C. Posner), *Ann. Math. Stat.* 42 (1971), pp. 1706–1716.
27. "Theorem 6.2.2" in J. H. van Lint, **Coding Theory**, Springer Lecture Notes in Mathematics no. 201 (1971), pp. 123–125.
28. "A Combinatorial Packing Problem" (with L. D. Baumert et. al.), **Computers in Algebra and Number Theory** (SIAM-AMS Proceedings vol. IV, 1971), pp. 97–108.
29. "The Limits of Minimum-Distance Decoding," *JPL Deep Space Network Progress Report* 42–2 (1971), pp. 29–61.
30. "Symmetrically Decable Codes" (with J. Savage), *JPL Deep Space Network Progress Report* 42–2 (1971), pp. 62–64.

31. “The Problem of Synchronization of Noisy Video,” *JPL Deep Space Network Progress Report 42– 3* (1971), pp. 105–107.
32. “Euler Products, Cyclotomy, and Coding” (with Howard Rumsey Jr.), *J. Number Theory* 4 (1972), pp. 302–311.
33. “Weights of Irreducible Cyclic Codes” (with L. D. Baumert), *Inf. and Control* 20 (1972), pp. 158–175.
34. “Weight Congruences for p-ary Cyclic Codes,” *Discrete Math.* 3 (1972), pp. 177–192.
35. “Weights Modulo 8 in Binary Cyclic Codes,” *JPL Deep Space Network Progress Report 42– 11* (1972), pp. 86–88.
36. “On the Weight Enumerators of Quadratic Residue Codes” (with J. Mykkeltveit and C. Lam), *JPL Deep Space Network Progress Report 42– 12* (1972), pp. 161–165.
37. “A Note on the Griesmer Bound” (with L. D. Baumert), *IEEE Trans. Inform. Theory* IT-19 (1973), pp. 134–135.
38. “Comment on ‘A Class of Codes for Asymmetric Channels and a Problem from the Additive Theory of Numbers,’ ” *IEEE Trans. Inform. Theory* IT-19 (1973), p. 137.
39. “Covering Tori with Squares” (with Herbert Taylor), *J. Comb. Thy.* 14 (1973), pp. 119–124.
40. “Hiding and Covering in a Compact Metric Space” (with Edward C. Posner), *Ann. Stat.* 1 (1973), pp. 729–739.
41. “A Golay-Viterbi Concatenated Coding Scheme for MJS’77” (with L. Baumert), *JPL Deep Space Network Progress Report 42– 18* (1973), pp. 76–84.
42. “A Low-Rate Improvement on the Elias Bound” (with Lloyd R. Welch and Howard Rumsey Jr.), *IEEE Trans. Inform. Theory* IT-20 (1974), pp. 676–678.
43. “ON DSN Antenna Scheduling” (with L. Harper and A. Odlyzko), *JPL Deep Space Network Progress Report 42– 20* (1974), pp. 53–56.
44. “The Ultimate Limits of Binary Coding for a Wideband Gaussian Channel” (with S. Butman), *JPL Deep Space Network Progress Report 42– 22* (1974), pp. 78–80.
45. “Forward Error Correction for the Ground Communications Facility” (with O. Adeyemi), *JPL Deep Space Network Progress Report 42– 22* (1974), pp. 114–117.

46. “Irreducible Cyclic Codes and Gauss Sums,” in **Combinatorics: Proceedings of the NATO Advanced Study Institute held at Nijenrode Castle, Breukelen, The Netherlands, 8-20 July 1974** (M. Hall Jr. and J. H. van Lint, eds.), Mathematical Centre, Amsterdam, 1975, pp. 185–202.
47. “Performance of Some Block Codes on a Gaussian Channel” (with L. Baumert), *Proc. 1975 ITC Conference*, pp. 189–195.
48. “Golay-Viterbi Decoding: Results of the MVM’73 X-Band Telemetry Experiment” (with L. Baumert), *JPL Deep Space Network Progress Report 42– 25* (1975), pp. 108–110.
49. “Zeroes of Functions in Finite Abelian Group Algebras” (with P. Delsarte), *Am. J. Math.* 98 (1976), pp. 197–224.
50. “Timesharing without Synchronization” (with A. Rubin), *Proc. 1976 ITC Conference*, pp. 16–20.
51. “The Analysis of Structured Programs—Part I: Kirchhoff’s Equations,” *JPL Deep Space Network Progress Report 42– 32* (1976), pp. 178–185.
52. “Decoding with Multipliers” (with L. Baumert and G. Solomon), *JPL Deep Space Network Progress Report 42– 34* (1976), pp. 43–46.
53. “New Upper Bounds on the Rate of a Code via the Delsarte-MacWilliams Inequalities” (with E. Rodemich, H. Rumsey, L. Welch), *IEEE Trans. Inform. Theory* IT-23 (1977), pp. 57–166.
54. “An Improved Upper Bound on the Block Coding Error Exponent for Binary Input Discrete Memoryless Channels” (with J. Omura), *IEEE Trans. Inform. Theory* IT-23 (1977), pp. 611–612.
55. “There Is No MacWilliams Identity for Convolutional Codes” (with J. Shearer), *IEEE Trans. Inform. Theory* IT-23 (November 1977), p. 775.
56. “On Detection of Combined Occurrences,” *Comm. ACM* 20 (1977), pp. 678–679.
57. **The Theory of Information and Coding**, Reading, MA: Addison-Wesley, 1977.
58. “Multiple-Access Channels without Synchronization” (with E. C. Posner), *ICC’77 Conference Record*, vol. 2, pp. 246–248.
59. “Synchronization Strategies for RFI Channels” (with H. Van Tilborg and S. Tung), *JPL Deep Space Network Progress Report 42– 38* (1977), pp. 103–106.

60. “An Asymptotic Analysis of a General Class of Signal Detection Algorithms” (with E. Rodemich), *JPL Deep Space Network Progress Report 42– 39* (1977), pp. 30–35.
61. “A Property of Euclid’s Algorithm and an Application to Padé Approximation” (with J. Shearer), *J. SIAM Appl. Math.* 34 (1978), pp. 611–615.
62. “On the Inherent Intractability of Certain Coding Problems” (with E. R. Berlekamp and H. Van Tilborg), *IEEE Trans. Inform. Theory* IT-24 (1978), pp. 384–386.
63. “The Lovász Bound and Some Generalizations” (with E. Rodemich and H. Rumsey), *J. Combinatorics, Information, and System Science*, 3 (1978), pp. 134–152.
64. “Soft Decision Decoding of Block Codes” (with L. D. Baumert), *Proc. 1978 ITC Conference*, pp. 879–882. A preliminary version appeared in *JPL Deep Space Network Progress Report 42– 47* (1978), pp. 60–64.
65. “An Analysis of Alternate Symbol Inversion for Improved Symbol Synchronization in Convolutionally Coded Systems” (with L. Baumert and H. Van Tilborg), *JPL Deep Space Network Progress Report 42– 44* (1978), pp. 90–97.
66. “A Public-Key Cryptosystem Based on Algebraic Coding Theory,” *JPL Deep Space Network Progress Report 42– 44* (1978), pp. 114–116.
67. “Coding for Optical Channels” with L. D. Baumert and H. Rumsey Jr.), *JPL Deep Space Network Progress Report 42– 49* (1978), pp. 70–77.
68. “Symbol Synchronization in Convolutionally Coded Systems” (with L. Baumert and H. van Tilborg), *IEEE Trans. Inform. Theory* IT-25 (1979), pp. 362–365.
69. “The Bounds of Delsarte and Lovasz, and Their Applications to Coding Theory,” in **Algebraic Coding Theory and Applications**, G. Longo, ed., CISM Courses and Lectures No. 258, Springer-Verlag, Vienna, 1979, pp. 107–178.
70. “Coding for the Photon Channel,” *Proc. 1979 National Telecommunications Conference*, pp. 23.3.1–23.3.2.
71. “A Note on Digital Signatures,” *JPL Deep Space Network Progress Report 42– 50* (1979), pp. 95–96.
72. “Coding for Optical Channels with Photon-Counting” (with L. Welch), *JPL Deep Space Network Progress Report 42– 52* (1979), pp. 61–66.
73. “The  $R_0$ –Parameter for Optical Communication Using Photon-Counting,” *JPL Deep Space Network Progress Report 42– 53* (1979), pp. 62–65.

74. “The Practical Limits of Photon Communication” (with A. Rubin and E. Rodemich), *JPL Deep Space Network Progress Report* 42– 55 (1979), pp. 63–67.

75. “A Probabilistic Version of Sperner’s Theorem” (with L. Baumert, E. Rodemich, and H. Rumsey), *Ars Combinatoria*, 9 (1980), pp. 91–100.

76. “Correlation Properties of Sets of Sequences Derived from Irreducible Cyclic Codes,” *Information and Control* 45 (1980), pp. 18–25.

77. “The Constantin-Rao Construction for Binary Asymmetric Error-Correcting Codes” (with E. Rodemich), *Information and Control* 44 (1980), pp. 187–196.

78. “Universal Noiseless Data Compression for Markov Sources” (with M. Pursley and M. Wallace), *Proc. 1980 Conf. Inform. Sciences and Systems* (Princeton, NJ, March 1980), pp. 164–167.

79. “Some Combinatorial Aspects of Spread-Spectrum Communication Systems,” *Proc. 1980 NATO ASI on Multi-User Communication* (Norwich, England, 1980) pp. 199–211.

80. “A Note on the  $R_0$ –Parameter for Discrete Memoryless Channels,” *JPL TDA Progress Report* vol. 42-60 (Sept.-Oct. 1980), pp. 96–97.

81. “Interleaved Block Codes for the Photon Channel,” *JPL TDA Progress Report* vol. 60 (Sept.-Oct. 1980), pp. 98–107.

82. “RFI Channels,” *JPL TDA Progress Report* vol 42-60 (Sept.-Oct. 1980), pp. 103–106.

83. “Multiple Access Channel Capacity Is Attainable without Synchronization” (with T. Cover and E. C. Posner), *IEEE Trans. Inform. Theory* IT-27 (1981), pp. 409–413.

84. “Efficient Universal Noiseless Source Codes” (with L. Davisson, M. Pursley, M. Wallace), *IEEE Trans. Inform. Theory* IT-27 (1981), pp. 269–279.

85. “On Sharing Secrets and Reed-Solomon Codes” (with D. V. Sarwate), *Comm. ACM*, 24 (1981), pp. 583–584.

86. “Practical Codes for Photon Communication,” *IEEE Trans. Inform. Theory* IT-27 (1981), pp. 393–398.

87. “An Inequality Arising in Information Theory” (with B. Reznick and J. Shearer), *SIAM J. Math Analysis* 12 (1981), pp. 931–934.

88. “An Information-Theoretic Study of Communication in the Presence of Jamming” (with W. Stark), *ICC 1981 Conference Record*, pp. 45.3.1–45.3.5.

89. "Capacity of FSK in the Presence of Fading and Partial Band Jamming" (with W. Stark), *NTC 1981 Conference Record*, pp. B7.4.1–B7.4.5.
90. "RFI Channels II," *JPL TDA Progress Report* vol. 42-65 (1981), pp. 75–80.
91. "The  $R_0$  Parameter for the Gaussian Channel," (with E. R. Rodemich) *JPL Deep Space Network Progress Report* 42– 65 (1981), pp. 81–85.
92. "Lifetime Analyses of Error-Control Coded Semiconductor RAM Systems" (with R. Goodman), *Proc. IEE*, vol. 129, pt. E, May 1982, pp. 81–85.
93. "The Optimal Code Rate vs. a Partial-Band Jammer" (with W. Stark), *Proceedings MILCOM'82*, pp. 8.5.1–8.5.4.
94. "Hamming Codes, Computer Memories, and the Birthday Surprise" (with R. M. F. Goodman), *Proc. 20th Allerton Conference on Communication, Control and Computing* (1982), pp. 672–679.
95. "A Maximum-Entropy Markov Chain" (with E. R. Rodemich), *Proceedings 17th Annual Conference on Information Science and Systems*, (1983), pp. 245–248.
96. "Communication in the Presence of Jamming—An Information Theoretic Approach," in **Secure Digital Communications**, G. Longo, ed., CISM Courses and Lectures, vol. 279, Springer-Verlag (1983), pp. 127–166.
97. "A Study of Optimal Abstract Jamming Strategies vs. Noncoherent MFSK" (with E. R. Rodemich), *Proceedings MILCOM'83*, pp. 1–6.
98. "The Jamming Game," in *Research Trends in Military Communications*, Proceedings ARO Workshop held May 1-4, 1983, pp. 116–123; USC Publication No. CSI-83-12-01.
99. "Channels with Block Interference" (with W. Stark), *IEEE Trans. Inform. Theory* IT-30 (1984), pp. 44–53.
100. "Node Synchronization for the Viterbi Decoder" (with G. Lorden and L. Swanson), *IEEE Transactions Comm.*, vol. COM-32 (1984), pp. 524–531.
101. "Soft-Error Correction for Increased Densities in VLSI Memories" (with K. Abdel-Ghaffar), *Proc. 11th Annual International Symposium on Computer Architecture* (Ann Arbor, Mich., 1984), pp. 248–250.
102. "A Study of Viterbi's Ratio-Threshold AJ Technique" (with L.-F. Chang), *MILCOM'84 Proceedings*, pp. 182–186.

103. “Average-Case Optimized Buffered Decoders” (with E. R. Berlekamp), in **The Impact of Processing Techniques on Communications**, J. K. Skwirzynski, ed. (Vol. 91E in the NATO ASI Series), Dordrecht: Martinus Nijhoff (1985), pp. 145–158.
104. “An Easy-to-Implement Coding Scheme for Multifrequency PPM,” (with L. Swanson), *JPL TDA Progress Report* vol. 42-77 (Jan.-Mar. 1984), pp. 57–63.
105. “Some Information Theoretic Saddlepoints” (with J. M. Borden and D. M. Mason), *SIAM J. Control and Optimization*, vol. 23 (1985), pp. 129–143.
106. “The Reliability of Computer Memories,” *Scientific American* vol. 252, no. 1 (January 1985), pp. 88–95.
107. “Coding Protection for Magnetic Tapes: A Generalization of the Patel-Hong Code” (with M. Blaum), *IEEE Trans. Inform. Theory* IT-31 (Sept. 1985), pp. 690–693.
108. “A Preliminary Analysis of the Hopfield Associative Memory” (with E. C. Posner and E. Rodemich), *Proc. 1985 Allerton Conference*, pp. 465–469.
109. “Symbol Stream Combining in a Convolutionally Coded System,” (with F. Pollara and L. Swanson), *JPL TDA Progress Report* vol. 42-81 (Jan.-Mar. 1985), pp. 47–50.
110. “Error and Erasure Probabilities for Galileo Uplink Code” (with J. Berner and E. C. Posner), *JPL TDA Progress Report* vol. 42-83 (July-September 1985), pp. 165–179.
111. “The Number of Stable Points of an Infinite-Range Spin Glass” (with E. C. Posner), *JPL TDA Progress Report* vol. 42-83 (July-September 1985), pp. 209–215.
112. “A Note on the Wideband Gaussian Broadcast Channel,” (with E. C. Posner and L. Swanson), *JPL TDA Progress Report* vol. 42-84 (Oct.-Dec. 1985), pp. 60–65.
113. “On the Decoder Error Probability for Reed-Solomon Codes,” (with L. Swanson), *JPL TDA Progress Report* vol. 42-84 (Oct.-Dec. 1985), pp. 66–72.
114. “An Entropy Maximization Problem Related to Optical Communication” (with E. Rodemich and L. Swanson), *IEEE Trans. Inform. Theory* IT-32 (1986), pp. 322–326.
115. “On the Existence of Optimum Cyclic Burst Correcting Codes” (with K. Abdel-Ghaffar, A. Odlyzko, and H. Van Tilborg), *IEEE Trans. Inform. Theory* vol. IT-32 (Nov. 1986), pp. 768–775.
116. “On the Decoder Error Probability for Reed-Solomon Codes” (with Laif Swanson), *IEEE Trans. Inform. Theory* vol. IT-32 (Sept. 1986), pp. 701–703.

117. “An Error-Control Code with an Imbalance of Ones and Zeros to Provide a Residual Carrier Component” (with E. R. Berlekamp, R. J. Currie, C. K. Rushforth, and Po Tong), *Proceedings MILCOM’86* pp. 31.1.1-31.1.4.

118. “A Note on the Wideband Gaussian Broadcast Channel” (with L. Swanson), *IEEE Trans. Comm.* vol. COM-35 (April 1987), pp. 452–453.

119. “The Capacity of the Hopfield Associative Memory” (with E. C. Posner, E. Rodemich, and S. Venkatesh), *IEEE Trans. Inform. Theory* vol. IT-33 (July 1987), pp. 461–482. Reprinted in: V. Vemuri, Ed. *Artificial Neural Networks: Theoretical Concepts*. Los Angeles: *IEEE Computer Society Press*, 1988.

120. **Finite Fields for Computer Scientists and Engineers**. Boston: Kluwer, 1987.

121. “Coping with Wayward 0’s and 1’s,”, pp. 85–95 in the book **Memory and Storage**. (I was the major contributor to this essay.) Alexandria, Va.: Time-Life Books , “Understanding Computers” Series, 1987.

122. “On the Capacity of Channels with Block Memory” (with W. Stark), *IEEE Trans. Inform. Theory* IT-34 (1988), pp. 322-324.

123. “The Rényi Redundancy of Generalized Huffman Codes” (with Anselm Blumer), *IEEE Trans. Inform. Theory*, vol. IT-34 (Sept. 1988), pp. 1242–1249.

124. “Hooray for Calculus!” (with H. Fredricksen and B. Reznick), *Mathematics Magazine*, vol. 61 (1988), p. 147.

125. “The Ultimate Limits of Information Density” (with K. Abdel-Ghaffar), in **Performance Limits in Communication Theory and Practice** (J.K. Skwirzynski, ed.) vol. E142 of NATO ASI Series. Dordrecht: Kluwer, 1988, pp. 267–279.

126. “A Decision Procedure for Hofstadter’s MIU System” (with Laif Swanson), *Mathematical Intelligencer* vol. 10 (1988), pp. 48-49.

127. “Finite-State Codes” (with F. Pollara and K. Abdel-Ghaffar), *IEEE Trans. Inform. Theory*, vol. IT-34 (Sept. 1988), pp. 1083–1089. (An earlier, but substantially identical, version of this paper appeared as “Constructions for Finite-State-Codes,” *JPL TDA Progress Report* vol. 42-90 (August 1987) pp. 42–49.

128. “Behavior of Codes at Very Low Signal-to-Noise Ratios” (with Chi-Chao Chao and Laif Swanson), *Proc. 1988 IEEE International Symposium on Information Theory*, p. 233.

129. “On the Path Weight Enumerators of Convolutional Codes,” (with C.C. Chao), *Proc. 1988 Allerton Conference*, pp. 1049–1058.

130. "The Decoding of Reed-Solomon Codes," *JPL TDA Progress Report* vol. 42-95 (November 1988) pp. 153–167.

131. "The Reliability of Single-Error Protected Computer Memories" (with Mario Blaum and Rodney Goodman), *IEEE Trans. Computers* vol. 37 (1988), pp. 114-119.

132. "The Undetected Error Probability for Reed-Solomon Codes", (with K.-M. Cheung), *Proc. MILCOM 1988*, pp. 5.7.1-5.7.5.

133. "Two-Dimensional Burst Identification Codes and Their Use in Burst Correction" (with K. Abdel-Ghaffar and H. van Tilborg), *IEEE Trans. Inform. Theory* vol. IT-34 (1988) pp. 494–504.

134. "Further Results on Finite-State Codes" (with F. Pollara and K.-M. Cheung), *JPL TDA Progress Report* vol. 42-92 (Oct.-Dec. 1987), pp. 56–62.

135. "A VLSI decomposition of the de Bruijn Graph" (with O. Collins, S. Dolinar, and F. Pollara), *Journal of the ACM*, vol. 39 (1992), pp. 931–948.

136. **Introduction to Discrete Mathematics** (with R. B. Ash and C. Ash). New York: Random House, 1989.

137. "Generalized DeBruijn Sequences" (with L. Popović), Proc. 1989 Allerton Conference on Communication, Control, and Computing, pp. 346–354.

138. "Channel Assignments in Cellular Radio" (with Kumar Sivarajan and John Ketchum), Proc. 1989 IEEE Vehicular Technology Conference, pp. 846–850.

139. "Truncation Effects in Viterbi Decoding" (with Ivan Onyszchuk), Proc. MILCOM 1989, pp. 29.3.1–29.3.5.

140. "A Symbol Error Upper Bound for Rate  $1/n$  Convolutional Codes" (with Ivan Onyszchuk), Proc. 1989 Allerton Conference on Communication, Control, and Computing, pp. 334–335.

141. "Some Easily-Analyzable Convolutional Codes" (with Sam Dolinar, Fabrizio Pol- lara, and Henk Van Tilborg), *JPL TDA Progress Report* vol.42-99 (November 1989), pp. 105–114. Also published in *Proc. 3rd IBM Workshop on ECC*, (Sept. 1989), pp. 102–115.

142. "Safety in Numbers: Protecting Data Mathemagically," *Engineering and Science*, vol. LII, no. 4, (Summer 1989), pp. 26–36.

143. “The Capacity-Cost function of a Noiseless Channel with Several Cost Constraints” (with L. Popović), Presented at 1990 International Symposium on Information Theory. (ISIT 1990 Book of Abstracts, p. 16.)

144. “Burst Error Correcting and Detecting Codes” (with K. Sivarajan and Henk van Tilborg), Presented at 1990 International Symposium on Information Theory. (ISIT 1990 Book of Abstracts, p. 153.)

145. “More on the Behavior of Binary Block Codes at Low-Signal-to Noise Ratios” (with C.-C. Chao), Presented at 1990 International Symposium on Information Theory. (ISIT 1990 Book of Abstracts, p. 126.)

146. “Performance of Binary Block Codes at Low Signal-to-Noise Ratios” (with C.-c. Chao, Eugene Rodemich, and Laif Swanson), *IEEE Trans. Inform. Theory* vol. IT-38 (1992) pp. 1677–1687.

147. “Ob-la-di p-log-p,” IEEE Information Theory Society newsletter, June 1990, p. 6.

148. “Dynamic Channel Assignment in Cellular Radio” (with Kumar Sivarajan and John Ketchum), Proc. 1990 IEEE Vehicular Technology Conference, pp. 631–637.

149. “What Fathers Do.” (Letter to the Editor) *New York Times Book Review*, August 12, 1990, p. 30.

150. “Performance Limits for FDMA Cellular Telephone Systems” (with Kumar Sivarajan), Proc. 1990 Allerton Conference on Communication, Control, and Computing, pp. 869–880.

151. “A Markov Chain Model for the Burst Error Statistics of Viterbi Decoding” (with Chichao Chao), Proc. 1990 International Symposium Inform. Theory and its Applications, pp. 391–394.

152. “Recent Advances in Coding for Near Error-Free Communications” (with K. M. Cheung, L. Deutsch, S. Dolinar, F. Pollara, M. Shahshahani, and L. Swanson) Proc. *Technology 2000* conference (November 27–28, 1990). NASA Conference Publication 3109, Vol. 2, pp. 229–237

153. “Performance Limits for Cellular Telephone Systems Defined by Hypergraphs,” (with. Kumar Sivarajan), Proc. Third IEE Conf. Telecommunications (Edinburgh, March 1991), pp. 360–365

154. “Performance Limits for Cellular Multiuser Communications Systems,” (with K. Sivarajan), proc. ISIT 91, p. 205.

155. "Asymptotic Performance of Fixed and Dynamic Channel Assignments in Cellular Radio," (with. Kumar Sivarajan), Proc. 1991 International Symposium on Information Theory, p. 154.

156. "Single Phased Burst Error Correcting Array Codes" (with R. Goodman and Mas Sayano), Proc. 1991 International Symposium on Information Theory, p. 195.

157. "Some Partial Unit Memory Convolutional Codes," (with K. Abdel-Ghaffar and G. Solomon), Proc. 1991 International Symposium on Information Theory, p. 196.

158. "Some Properties of Memoryless Multiterminal Interference Channels," (with M. Mandell), Proc. 1991 International Symposium on Information Theory, p. 212.

159. "Some Extensions of the Griesmer Bound" (with Gus Solomon) *JPL TDA Progress Report* vol. 42-105 (Jan.-Mar. 1991), pp. 41–44.

160. "Partial Unit Memory Convolutional Codes" (with Khaled Abdel-Ghaffar and Gustave Solomon), *JPL TDA Progress Report* vol. 42-107 (Jul.-Sept. 1991), pp. 57–72.

161. "Phased Burst Error Correcting Array Codes," (with R. Goodman and M. Sayano), *IEEE Trans. Inform. Theory* IT-39 (March 1993), pp. 684–693.

162. "Performance Limits for Channelized Cellular Telephone Systems", (with Kumar Sivarajan) *IEEE Trans. Inform. Theory* IT-40 (January 1994), pp. 21-34.

163. "The Analysis of Convolutional Codes via the Extended Smith Algorithm" (with Ivan Onyszchuk), *JPL TDA Progress Report* vol. 42-112 (February 1993), pp. 22–30.

164. "The Extended Invariant Factor Algorithm with Application to the Forney Analysis of Convolutional Codes" (with Ivan Onyszchuk), Proc. 1993 *Int. Symp. Inform. Theory*, p. 142.

165. "Some VLSI Decompositions of the deBruijn Graph," with S. Dolinar and T.-M. Ko, pp. 189–198 in *A Collection of Contributions in Honour of Jack Van Lint*, P. J. Cameron and H. C. A. van Tilborg, eds. (Topics in Discrete Mathematics, vol. 7. Amsterdam: North-Holland, 1992.) Also published in *Discrete Mathematics* 106/107 (1992), pp. 189–198.

166. "VLSI Decompositions for deBruijn Graphs," (with Sam Dolinar and Tsz-Mei Ko), Proc. 1992 IEEE International Symposium on Circuits and Systems, pp. 1855–1858

167. "Maximal Codeword Lengths in Huffman codes," (with Y. S. Abu-Mostafa), *Computers and Mathematics with Applications*, vol. 39 (2000), pp. 129–134. (In honor of the 60th birthday of Professor Solomon W. Golomb.) Also *JPL TDA Progress Report* vol. 42-110 (August 1992), pp. 188–193.

168. "A Comparison of CDMA and Frequency Hopping in a Cellular Environment," (with M. Mandell), Proc. First International Conference on Universal Personal Communications (UPC '92). Dallas: Sept. 29–Oct. 2, 1992, pp. 07.01.1–07.01.5

169. "Heavy Traffic Performance of a Class of Channel Assignment Algorithms," (with K. Sivarajan), Proc. Third International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC '92). Boston: October 19–21, 1992, pp. 550–555. (Also published as IBM Research Report RC 18212 (79916).)

170. "Maximizing Marginal Revenue In Generalized Blocking Service Networks," (with K. Sivarajan), Proc. 1992 Allerton Conference on Communication, Control, and Computing, pp. 455–464.

171. "A Comparison of CDMA and Frequency Hopping in a Cellular Environment," (with M. Mandell). Proc. 1993 *Int. Symp. Inform. Theory*, p. 252.

172. "Comparison of the Capacities of CDMA, FH, and FDMA Cellular Systems," (with M. Izumi and M. Mandell), proc. Wireless 93 (The Fifth Annual International Conference on Wireless Communications), Calgary Canada, July 1993, pp. 145–154.

173. "The General Theory of Convolutional Codes," (with R. P. Stanley) *JPL TDA Progress Report* vol. 42-113 (May 1993), pp. 89–98.

174. "Uncorrectable Sequences and Telecommand," (with L. Ekroot, S. Dolinar, and L. Swanson) *JPL TDA Progress Report* vol. 42-113 (May 1993), pp. 99–105.

175. "Trace-Shortened Reed-Solomon Codes," (with G. Solomon), pp. 32–36 in *Communications Theory and Applications II* (Selected papers from the 2nd International Symposium on Communication Theory and Applications, Ambleside, UK, July 1993), B. Honary, M. Darnell, and P. Farrell, eds. ©1994, HW Communications, Ltd. Also appeared in *JPL TDA Progress Report* vol. 42-117 (May 1994). pp. 119–127.

176. "Why Channel Assignment Algorithms are Asymptotically Smart," with E. R. Rodemich and S. K. Deora. 1993 Allerton Conference on Communication, Control, and Computing, September 1993, pp. 207–216.

177. "Reed-Solomon Codes and the Exploration of the Solar System," (with L. Swanson), Chapter 3 (pp. 25–40) in *Reed Solomon Codes and Their Applications*, S. B. Wicker and V. K. Bhargava (eds.). New York: IEEE Press, 1994.

178. "Estimating the Size of Huffman Code Preambles." (with T. H. Palmatier), *JPL TDA Progress Report* vol. 42-114 (August 1993), pp. 90–95.

179. Obituary of Edward C. Posner, *IEEE Information Theory Newsletter*, vol. 43 (Sept. 1993), pp. 1–3.

180. “Counting Minimal Generator Matrices,” (with Kim Lumbard) Proc. ISIT 1994, p. 18.

181. “The Viterbi Decoding Complexity of Linear Block Codes,” Proc. ISIT 1994, p. 341.

182. “Subspace Subcodes of Reed-Solomon Codes,” (with M. Hattori and W. Lin). Proc. ISIT 1994, p. 430.

183. “The Trellis Complexity of Convolutional Codes” (w. W. Lin), pp. 106–132 in *Communications, Coding, and Signal Processing* Taunton, Somerset, England: Research Studies Press, 1997.

184. “The Trellis Complexity of Convolutional Codes” (w. W. Lin), *Proc. 3rd Int. Symp. Comm. Thy. Appl.* (Ambleside, UK, June 1995), pp. 101–106.

185. “On the BCJR Trellis for Linear Block Codes,” *IEEE Trans. Inform. Theory*, vol. IT-42, no. 4 (July 1996), pp. 1072–1092.

186. “The Permutation Trellis Complexity of Linear Block Codes” (with S. Dolinar, L. Ekroot, A. Kiely, and W. Lin), Proc. 32nd Annual Allerton Conf. on Communication, Control, and Computing, (Sept. 1994), pp. 60-74.

187. “Trellis Decoding Complexity of Linear Block Codes,” (with A. Kiely, S. Dolinar, L. Ekroot, and W. Lin), *IEEE Trans. Inform. Theory*, vol. IT-42, no. 6 (November 1996), pp. 1687–1697.

188. “Minimal Trellises for Linear Block Codes and their Duals,” (with A. Kiely, S. Dolinar, L. Ekroot, and W. Lin, *JPL TDA Progress Report* vol. 42-121 (May 1995), pp. 148–158.

189. “Trellis Complexity Bounds for Decoding Linear Block Codes,” (with A. Kiely, S. Dolinar, L. Ekroot, and W. Lin, *JPL TDA Progress Report* vol. 42-121 (May 1995), pp. 159–172.

190. “Review of ‘A Collection of Contributions in Honour of Jack Van Lint’,” (book review), *IEEE Trans. Inform. Theory*, vol. IT-40 (July 1994), p. 1303.

191. “Asymptotic Performance Analysis of a Timid DCA Algorithm” (with S. K. Deora), Proc. Conf. Inform. Sciences and Systems (Baltimore, Maryland), March 1995.

192. “Data Expansion with Huffman Codes,” (with J.-F. Cheng, M. Effros, and S. Dolinar) Proc. 1995 ISIT, p. 325.

193. “The Trellis Complexity of Convolutional Codes,” (with Wei Lin) *IEEE Trans. Inform. Theory*, vol. IT-42, no. 6 (November 1996), pp. 1855–1864.

194. “Performance Limits for Blocking Multiuser Communication Networks,” (with S. K. Deora), Proc. 1995 IT Workshop on Information Theory, Multiple Access, and Queueing, St. Louis MO, April 1995, p. 49.

195. “Superimposed Convolutional Codes,” (with J.-F. Cheng), Proc. 1995 Int. Symp. Comm. (ISCOM 95, Taipei Taiwan, December 1995.). pp. 105–110.

196. “The Turbo Decision Algorithm,” (with E. Rodemich and J.-F. Cheng), Proc. 33rd 1995 Allerton Conference on Communication, Control, and Computing, pp. 366–381.

197. “Subspace Subcodes of Reed-Solomon Codes,” (with M. Hattori and G. Solomon), *IEEE Trans. Information Theory*, vol. IT-44 (Sept. 1998), pp. 1861–1880.

198. “Performance Analysis of Turbo Codes,” (with D. Divsalar, S. Dolinar, and F. Pollara), Proc. *MILCOM 1995*, pp. 91–96.

199. “Asymptotic Coding Gain and Trellis Complexity,” (with W. Lin), Proc. 33rd 1995 Allerton Conference on Communication, Control, and Computing, pp. 313–322.

200. “Unit-Memory Hamming Turbo Codes,” (with J.-F. Cheng), Proc. 1995 ISIT, p. 33.

201. “An Inequality on Entropy,” (w. Z. Yu), Proc. 1995 ISIT, p. 329.

202. “Information Theory.” Article to appear in *Encyclopedia Americana*.

203. “The Algebraic Theory of Convolutional Codes,” Chapter 12, pp. 1065–1138 in *Handbook of Coding Theory*, V. S. Pless and W.C. Huffman, eds. Amsterdam: Elsevier Science Publishers, 1998.

204. “The Effective Free Distance of Turbo-Codes,” (w. D. Divsalar), *Electronics Letters*, vol. 32, no. 5 (29 Feb. 1996), pp. 445–446.

205. “Hybrid Trellis Decoding of Some Convolutional Codes,” (w. Wei Lin), Proc. Princeton CISS 1996, March 1996, Princeton, pp. 572–577.

206. “Hyperimposed Convolutional Codes,” (w. J. F. Cheng), Proc. 1996 IEEE International Communication Conference, Dallas, TX, pp. 979–983.

207. “On Simplified Modelling of the Leaky Bucket,” (w. M. Jennings, J. Murphy, and Z. Yu), ...

208. Obituary of Gus Solomon, *IEEE Information Theory Newsletter*, vol. 46, no. 2 (June 1996).

209. "Statistical Multiplexing of Asynchronous Regulated Traffic," (with Hui Jin and Zhong Yu), *Proc. 1996 Allerton Conference on Communication, Control, and Computing*, pp. 469–481.

210. "Some High-Rate Near capacity Codecs for the Gaussian Channel," (with J.-F. Cheng), *Proc. 1996 Allerton Conference on Communication, Control, and Computing*, pp. 494–503.

211. "Gus's last theorem? Fast multiplication in  $GF(2^m)$ ," pp. 736–738 in vol. 2 of proc. *1997 IEEE Pacific Rim Conference on Communications, Computers and Signal Processing*.

212. "Turbo Decoding as an Instance of Pearl's 'Belief Propagation' Algorithm," (with David MacKay and J.-F. Cheng), *IEEE J. Sel. Areas Comm.*, vol. 16, no. 2 (Feb. 1998), pp. 140–152.

213. "Belief Propagation in Loopy Bayesian Networks: Experimental Results," (with G. Horn), *Proc. 1997 International Symposium Inform. Theory*, p. 232.

214. "A General Algorithm for Distributing Information in a Graph," (with S. M. Aji), *Proc. 1997 International Symposium Inform. Theory*, p. 6.

215. "Trellis-Canonical Generator Matrices for Convolutional Codes," (with W. Lin and M. Xu), *Proc. 1997 International Symposium Inform. Theory*, p. 286.

216. "The Generalized Distributive Law" (with S. M. Aji), *Proc. 1997 Int. symp. Comm. Thy. Appl.* (Ambleside, U.K. July 1997), pp. 135–146.

217. "Iterative Decoding on Graphs with a Single Cycle" (with Srinivas M. Aji and Gavin B. Horn), proc. ISIT 1998, p. 276

218. "Junction Tree Representations for Linear Block Codes" (w. Meina Xu), proc. ISIT 1998, p. 253.

219. "How to Compute Weight Enumerators for Convolutional Codes," pp. 121–141 in *Communications and Coding (P. G. Farrell 60th birthday celebration)*, M. Darnell and B. Honary, eds. New York: John Wiley & Sons, 1998.

220. "The Generalized Distributive Law" (w. S. M. Aji), *IEEE Trans. Inform. Theory*, vol. IT-46, no. 2 (March 2000), pp. 325–343.

221. "On the convergence of iterative decoding on graphs with a single cycle," (w. S. M. Aji and Gavin B. Horn), Proc. CISS 1998, pp. 428–434.

222. “Junction tree representations for linear block codes,” (w. M. Xu), Proc. CISS 1998, pp. 435–438.

223. “Pseudorandom and Self-Terminating Interleavers for Turbo Codes,” (with M. Hattori and J. Murayama), Proc. ITW San Diego 1998, pp. 9–10.

224. “Iterative Min-Sum Decoding of Tail-Biting Codes,” (w. S. Aji, G. Horn, and M. Xu). Proc. ITW Killarney 1998, pp. 68–69.

225. “Iterative Min-Sum Decoding of Tail-Biting Codes,” (w. S. Aji, G. Horn, and M. Xu.), Proc. 1998 Allerton Conference, pp. 15–24.

226. “On the design of concatenated coding systems with interleavers,” (w. D. Divsalar), TMO Progress Report vol. 42-134 (August 15, 1998), pp. 1–22.  
[\(\[http://tmo.jpl.nasa.gov/tmo/progress\\\_report/42-134/134D.pdf\]\(http://tmo.jpl.nasa.gov/tmo/progress\_report/42-134/134D.pdf\) .\)](http://tmo.jpl.nasa.gov/tmo/progress_report/42-134/134D.pdf)

227. “Coding Theorems for ‘Turbo-Like’ Codes,” (w. Dariush Divsalar and Hui Jin), Proc. 1998 Allerton Conference, pp. 201–210.

228. “The Iterative Decoding of Cycle Codes,” (w. Gavin B. Horn), Proc. CISS 1999, May 17–19, 1999, Baltimore, MD.

229. “Viterbi’s Algorithm and Matrix Multiplication,” (w. Meina Xu), to appear in Proc. CISS 1999, May 17–19, 1999, Baltimore, MD.

230. “The Discrete Noiseless Channel Revisited,” (w. A. Khandekar and E. Rodemich), pp. 115–137 in *Coding, Communications, and Broadcasting* (P. Farrell, M. Darnell, and B. Honary, eds.) (Proc. 1999 International Symposium on Communications Theory and Applications, July 1999). Baldock, Hertfordshire, England: Research Studies Press Ltd., 2000.

231. “Optical Channels with Dead Time,” (w. A. Khandekar), Proc. 1999 Allerton Conference, pp. .

232. “BSC Thresholds for Code Ensembles Based on ‘Typical Pairs’ Decoding,” (w. S. Aji, H. Jin, A. Khandekar, and D. MacKay), pp. 195–210 in the book *Codes, Systems, and Graphical Models*, vol. 123 in the Springer-Verlag series *IMA Volumes in Mathematics and its Applications* (B. Marcus and J. Rosenthal, eds.) New York: Springer, 2001.

233. “RA Codes Achieve AWGN Channel Capacity,” (w. Hui Jin). Proc. 13th Int. Symp. AAECC-13 (Springer Lecture Notes in Computer Science no. 1719), pp. 10–18.

234. “Typical Pairs Decoding on the AWGN channel,” (w. Hui Jin). Proc. 2000 International Symp. Inform. Theory and its Applications, pp. 180–183.

235. "General Coding Theorems for Turbo-Like Codes," (w. H. Jin), Proc. ISIT 2000, p. 120.

236. "AWGN Coding Theorems from Ensemble Weight Enumerators," (w. D. Divsalar, S. Dolinar, and H. Jin), Proc. ISIT 2000, p. 458.

237. "Irregular Repeat-Accumulate Codes," (w. H. Jin and A. Khandekar), Proc. 2nd. International Conf. Turbo Codes, Brest, France, 4–7 Sept. 2000, pp. 1-8.

238. "Permutations Preserving Divisibility," (w. C. Le Dantec and P. Piret), *IEEE Trans. Inform. Theory*, vol. 47, no. 3 (March 2001), pp. 1206–1207.

239. "Information Theory." Eight-page article in *Microsoft Encarta Encyclopedia 2000*.

240. "Coding Theorems for Turbo Code Ensembles," (w. Hui Jin). *IEEE Trans. Inform. Theory*, vol. 48, no. 6 (June 2002), pp. 1451–1461

241. "Performance of IRA Codes on Rayleigh Fading Channels," (w. Hui Jin). Presented at CISS 2001.

242. "On the complexity of reliable communication on the erasure channel," (w. A Khandekar). Proc. ISIT 2001 (June 2001), p. 1.

243. "Are turbocodes effective on nonstandard channels?" *IEEE Information Theory Society Newsletter*, vol. 51, no. 4 (December 2001), pp. 1–8.

244. "Are turbocodes effective on nonstandard channels?" (w. A. Khandekar) *Proc. 6th Int. Symp. Comm. Theory and Appls.* (Ambleside, U.K, July 2001), pp. 293–298.

245. "The Generalized Distributive Law and Free Energy Minimization" (w. Srinivas M. Aji). Proc. 2001 Allerton Conf., pp. 672–681.

246. "Graph based codes for synchronous multiple access channels," (w. R. Palanki and A. Khandekar), Proc. 2001 Allerton Conf.

247. "A lower bound on the iterative decoding threshold of irregular LDPC codes," (w. A. Khandekar) Proc. 2002 CISS Conference, Princeton U., March 2002

248. "Communication Strategies for Collaborative Robotic Exploration," (w. J. Thorpe), to appear in the JPL IPN Progress Reports.

249. "Scheduling algorithms for wireless ad hoc sensor networks," (w. C. Florens), submitted to Globecom 2002.

250. **The Theory of Information and Coding (2nd Ed.)**, Cambridge: Cambridge University Press, April 2002.

251. "Input-Output Weight Enumerators for Punctured Convolutional Codes," (w. Takashi Yokokawa, Toshiyuki Miyauchi, and Masayuki Hattori), to appear in Proc. ISITA 2002, Xi'an PRC, Oct. 7–11, 2002.
252. "Results to get Maximal Quasihermitian Curves: New Possibilities for AG Codes," (w. M.C. Rodriguez-Palánquex), pp. 55–62 in *Information, Coding, and Mathematics* (M. Blaum, P. Farrell, and H. van Tilborg, eds.). Boston: Kluwer Academic Publishers, 2002.
253. "Data Fusion Algorithms for Collaborative Robotic Exploration," with (Jeremy Thorpe), to appear in the JPL publication "IPN Progress Reports."
254. "Belief Propagation on Partially Ordered Sets," (with Muhammed Yildirim), to appear in the Proceedings of the 15th Internatonal Symposium on Mathematical Theory of Networks and Systems (MTNS 2002).