

CURRICULUM VITAE

PETER MICHAEL LEVY

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Degrees: B.M.E. 1958, City College of New York
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American Physical Society, 1961-
Materials Research Society, 1991-
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National Science Foundation Fellow (1958-1962)
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July, 1966 -Feb., 1970: Yale University, Assistant Professor
Feb., 1970 -Aug., 1975: New York University, Associate Professor
Sept., 1975- New York University, Professor of Physics
Sept.,1976 -Sept., 1982: New York University, Chairman, Department of Physics
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Research grants from the **National Science Foundation:**

Magneto-Elastic and Thermodynamic Behavior of the Rare-Earth Pnictides, February, 1972 -February, 1975;

Theory of Thermodynamic Properties of High-Degree Pair Interactions, March, 1975-January, 1979;

Theory of Orbital Effects in Rare-Earth Compounds, February, 1979-January, 1982;

Theory of Orbital Effects in Magnetic Alloys and Compounds, February, 1982-June, 1986.

Magnetotransport in Layered Structures, May 15,2002- April 30, 2005.

Research grants from **Office of Naval Research:**

Magnetically Controlled Electrical Transport in Multilayered Structures, May 1, 1991 - September 30, 1995.

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Research Grant from **the Defense Advanced Research Projects Agency and the Office of Naval Research:**

Fundamental Limits to Small Scale Magnetoresistance Memory and Sensors, July 31, 1996- December 31, 2002 .

Subcontract from IBM on Defense Advanced Research Projects Agency project:

Advanced Magnetic Random Access Memory Initiative, September, 1996- June, 2001.

American Node Project Leader on **European Community Research Training Network:**

Computational Magnetolectronics, September, 2000- September, 2004.

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Travel grant from **National Science Foundation:**

Magnetotransport Properties of Kondo Lattice Systems, February, 1987-July, 1989.

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Seminar Grants from National Science Foundation and Office of Naval Research:

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Publications

1. *The Magnetic Behavior of Gadolinium Trichloride Hexahydrate at Low Temperatures*, Journal of the Physics and Chemistry of Solids **25**, 431-435 (1964).
2. *Rare-Earth-Iron Exchange Interaction in the Garnets I. Hamiltonian for Anisotropic Exchange Interaction*, Physical Review **135**, A155-165 (1964).
3. *The Contribution of the Magnetization to the After-Effect in Iron*, Journal of the Physics and Chemistry of Solids **26**, 415-421 (1965).
4. *Anisotropy of Exchange in Ytterbium Iron Garnet*, Physics Letters **19**, 8-9 (1965).
5. *Magnetic Behavior of Gadolinium Sulfate Octahydrate at Low Temperature*, Journal of Chemical Physics **43**, 4422-4424 (1965).
6. *The Anisotropy of the Rare-Earth-Iron Exchange Interaction in the Garnets*, Journal of Applied Physics **37**, 1314-1315 (1966).
7. *Rare-Earth-Iron Exchange Interaction in the Garnets. II. Exchange Potential for Ytterbium*, Physical Review **147**, 311-319 (1966).
8. *Magnetic Anisotropy of Europium in Iron Garnet at Low Temperature*, Physical Review **147**, 320-331 (1966).
9. D.P. Landau (co-author), *Shape Dependence of the Specific Heat of Magnetic Systems with Long-Range Interactions*, Journal of Applied Physics **39**, 1128-1129 (1968).
10. *On the Shape Dependence of the Thermodynamic Properties of Magnetic Systems*, Physical Review **170**, 595-602 (1968).
11. *Antisymmetric Exchange*, Physical Review Letters **20**, 1366-1370 (1968).
12. R.B. Stinchcombe (co-author), *Dipole-Dipole Forces in the Heisenberg Model - Dependence of the Free Energy on Sample Shape*, Journal of Physics C (Proceedings of the Physical Society) **1**, 1584-1589 (1968).
13. *Anisotropy in Two-Center Exchange Interactions*, Physical Review **177**, 509-525 (1969).
14. *Pair Interaction Hamiltonian in Fictitious Angular Momentum Space*, Journal of Applied Physics **40**, 1139-1141 (1969).
15. G.M. Copland (co-author), *Isotropic Exchange and the Lande Interval Rule*, Physical Review **180**, 439 (1969).
16. *Permutation Degeneracy in the Presence of Large Spin-Orbit Coupling*, Chemical Physics Letters **3**, 556-559 (1969).
17. *Indirect Exchange via Spin-Orbit Coupled States*, Solid State Communications **7**, 1813-1818 (1969).
18. *Indirect Exchange in the Rare-Earth Intermetallics*, Journal of Applied Physics **41**, 902-904 (1970).
19. G.M. Copland (co-author), *On the Direct Exchange between *d* Electrons*, Physical Review **B1**, 3043-3050 (1970).
20. *Paramagnetic Curie Temperatures of the Rare-Earth Monophosphides*, Physical Review **B2**, 1429-1431 (1970).

21. *Interaction d'Exchange s-f dans Les Composés Intermetalliques*, Journal de Physique (Paris) **32**, Colloque C1, 365-367 (1971).
22. *Dependence of the s-f Exchange Coupling Parameter on Rare-Earth Atomic Number*, Journal of Applied Physics **42**, 1702-1703 (1971).
23. H.H. Chen (co-author), *Quadrupole Phase Transitions in Magnetic Solids*, Physical Review Letters **27**, 1383-1385 (1971).
24. H.H. Chen (co-author), *Structural and Magnetic Phase Transition in the Rare-Earth Pnictides*, Physical Review Letters **27**, 1385-1388 (1971).
25. H.H. Chen (co-author), *Quadrupole Coupling in the Rare-Earth Pnictides*, AIP Conference Proceedings **5**, 373-377 (1972).
26. T.J. Moran, R.L. Thomas and H.H. Chen (co-authors), *Elastic Properties of DySb Near the Magnetic and Structural Phase Transition*, Physical Review **B7**, 3238-3241 (1973).
27. B.D. Dunlap and I. Nowik (co-authors), *Orbital Contributions to the Transferred Hyperfine Fields in Rare-Earth Compounds*, Physical Review **B7**, 4232-4241 (1973).
28. H.H. Chen (co-author), *Dipole and Quadrupole Phase Transitions in Spin-One Models*, Physical Review **B7**, 4267-4284 (1973).
29. H.H. Chen (co-author), *High Temperature Series Expansions for Spin-One Ferromagnetism*, Physical Review **B7**, 4284-4289 (1973).
30. L.F. Uffer and H.H. Chen (co-authors), *Cooperative Jahn-Teller Effect in Dysprosium Antimonide*, AIP Conference Proceedings **10**, 553-557 (1973).
31. M.J. Sablik and H.H. Teitelbaum (co-authors), *Quadrupolar Coupling and Its Contribution to Electrical Resistivity*, AIP Conference Proceedings **10**, 548-552 (1973).
32. *Theoretical Study of the Elastic Properties of Dysprosium Antimonide*, Journal of Physics **C6**, 3545-3556 (1973); *Ibid.*, **C7**, 2760 (1974).
33. M.J. Sablik, H. Taub, L.F. Uffer and S.J. Williamson (co-authors), *Electrical Resistivity of Some Rare-Earth Antimonides*, Proceedings of the International Conference on Magnetism, Moscow 1973, Vol. VI, 217-221 (Moscow, Nauka, 1974).
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41. *Elementary Excitations of High-Degree Pair Interactions in Rare-Earth Compounds*, in **Magnetism in Metals and Metallic Compounds** edited by J.T. Lopuszanski, A. Pekalski and J. Przystawa, pp. 265-286 (Plenum Press, New York and London 1976).
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50. J.J. Sudano (co-author), *Phase Diagram for the Cubic Model in the Kikuchi Approximation*, Physical Review **B18**, 5078-5086 (1978).
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53. *The Evidence for Anisotropic Rare-Earth-Conduction Electron Interactions*, Journal de Physique (Paris) **40**, Colloque C5, 8-13 (1979).
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75. P. Fischer, A. Furrer, E. Kaldis, D. Kim and J.K. Kjems (co-authors), *Phase Diagrams and Magnetic Excitations in Holmium Phosphide*, *Physical Review* **B31**, 456-469 (1985).
76. G. Lacueva (co-author), *Large Two-Ion Magnetoelastic Interactions in Dysprosium Antimonide*, *Physical Review* **B31**, 650-651 (1985).

77. D. Schmitt (co-author), *Ab-Initio Calculation of Indirect Multipolar Pair Interactions in Rare-Earth Intermetallic Compounds*, *Journal of Magnetism and Magnetic Materials* **49**, 15-49 (1985).
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82. Q. Zhang (co-author), *Long Range Interactions between Local Moments in Metals: Application to Spin Glass Systems*, *Physical Review* **B33**, 665-667 (1986).
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84. S.M. Goldberg (co-author), *Effect of Spin-Orbit Scattering on the Spin Glass Temperature*, *Journal of Magnetism and Magnetic Materials*, **54-57**, 183-184 (1986).
85. Q. Zhang (co-author), *Long Range Interactions and the Spin Glass Temperature*, *Journal of Magnetism and Magnetic Materials*, **54-57**, 133-134 (1986).
86. S.M. Goldberg and A. Fert (co-authors), *Anisotropy in Binary Metallic Spin Glass Alloys I: Transition Metals*, *Physical Review* **B33**, 276-290 (1986).
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88. Q. Zhang (co-author), *Spin Coupling between Magnetic Impurities in Metals*, *Physical Review* **B34**, 1884-1898 (1986).
89. Q. Zhang (co-author), *Concentration Dependence of the Spin-Glass Temperature of Metallic Alloys*, *Physical Review* **B34**, 7965-7968 (1986).
90. A. Fert and A. Hamzic (co-authors), *Theory of the Hall Effect in Heavy Fermion and Mixed Valence Systems*, *Journal of Magnetism and Magnetic Materials* **63-64**, 535-538 (1987).
91. A. Fert (co-author), *Theory of the Hall Effect in Heavy Fermion Compounds*, *Physical Review* **B36**, 1907-1916 (1987).
92. W. Guo and D.L. Cox (co-authors), *Hall Effect for Kondo Systems*, *Journal of Applied Physics* **63**, 3896-3898 (1988).
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108. S. Zhang (co-author) *Theory of Magnetoresistance in Magnetic Superlattices*, Journal of Magnetism and Magnetic Materials **93**, 67-74 (1991).
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110. S. Zhang (co-author) *Conductivity Perpendicular to the Plane of Multilayered Structures*, Journal of Applied Physics **69**, 4786-4788 (1991).
111. E.C. Ethridge, J.L. Fry and Y. Wang (co-authors) *Interlayer Magnetic Coupling in Transition Metal Multilayered Structures*, Journal of Applied Physics **69**, 4780-4782 (1991).
112. S. Zhang (co-author) *Enhanced Temperature-Dependent Magnetoresistivity of Fe/Cr Superlattices*, Physical Review B **43**, 11048-11056 (1991).
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147. *Theory of Giant Magnetoresistance of Magnetic Multilayers*, chapter in Aspects of Modern Magnetism, edited by F. C. Pu, Y. J. Wang and C.H. Shang, World Scientific, Singapore; 1996) 148-163.
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149. S. Zhang (co-author), *Resistivity due to Domain Wall Scattering*, Physical Review Letters **79**, 5110-5113 (1997).
150. S. Zhang (co-author), *Interplay of the Specular and Diffuse Scattering at Interfaces of Magnetic Multilayers*, Physical Review **B57**, 5336-5339(1998).
151. A.D. Kent, U. Ruediger, J. Yu, S. Zhang, and S.S.P. Parkin (co-authors), *Magnetoresistance due to Domain Walls in Micron Scale Fe Wires with Stripe Domains*, IEEE Transactions on Magnetics, Vol. **34**, 900-902 (1998).

152. S. Maekawa and P. Bruno (co-authors), *Range Dependence of Interlayer Exchange Coupling*, Physical Review **B58**, 5588-5593 (1998).
153. C. Blaas, P. Weinberger, L. Szunyogh, C.B. Sommers and I. Mertig (co-authors), *Giant magnetoresistance of repeated multilayers of Cu(3)Ni(3) embedded in Cu(100)*, Philosophical Magazine **B 78**, 549 -555(1998).
154. Kuising Wang, Shufeng Zhang, Laszlo Szunyogh and Peter Weinberger (co-authors), *Role of Electronic Structure in Magnetic Tunneling*, Journal of Magnetism and Magnetic Materials **189**, L131-L135 (1998).
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156. Shufeng Zhang (co-author), *Spin Dependent Tunneling*, Current Opinion in Solid State & Materials Science vol **4**, 223-229 (1999).
157. C. Blaas, P. Weinberger, L. Szunyogh, J. Kudrnovsky, V. Drchal and C.B. Sommers (co-authors), *On the orientational dependence of giant magnetoresistance*, European Physical Journal B **9**, 245- 250 (1999).
158. Shufeng Zhang (co-author), *Models for Magnetoresistance in Tunnel Junctions*, European Physical Journal **B10**, 599-606 (1999).
159. C. Blaas, P. Weinberger, L. Szunyogh and C.B. Sommers (co-authors), *Ab-Initio Calculations of Magnetoresistance for Magnetic Multilayers*, Physical Review B **60**, 492-501 (1999).
160. Horacio Camblong (co-author), *Electrical resistivity of a thin metallic film*, Physical Review B **60**, 15 782 (1999).
161. Asya Shpiro (co-author), *Resistance across an interface and that measured far from it*, Physical Review B **63**, 014 419 (2001).
162. Christoph Uiberacker, Kuising Wang and Carsten Heide (co-authors), *Ab-initio non-equilibrium calculation of magnetic tunnel junctions*, Journal of Applied Physics, **89**, 7561 (2001).
163. Claudia Blass, Laszlo Szunyogh, Peter Weinberger and Charles Sommers (co-authors), *Electrical transport of bulk Ni_xFe_{1-x} alloys and related spin-valve systems*, Physical Review B **63**, 224408 (2001).
164. Christoph Uiberacker (co-author), *Role of symmetry on interface states in magnetic tunnel junctions*, Physical Review B **64**, 193404 (2001); *erratum*, Physical Review B **65**, 169904(E) (2002).
165. Ingrid Mertig (co-author), *GMR-Theory*, chapter 2 in Spin dependent transport in magnetic nanostructures, Gordon and Breach- Taylor and Francis, edited by Sadamichi Maekawa and Teruo Shinjo (2002).
166. Kuising Wang, Peter H. Dederichs, Carsten Heide, Shufeng Zhang, Laszlo Szunyogh(co-authors), *An approximate calculation for transport in magnetic tunnel junctions in the presence of localized states*, Philosophical Magazine B **82**, 763 (2002).
167. Shufeng Zhang and Albert Fert (co-authors), *Mechanisms of spin-polarized current-driven magnetization switching*, Physical Review Letters **88**, 236601 (2002).
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170. Claudia Blaas, Laszlo Szunyogh, Peter Weinberger, Charles Sommers and Jing Shi (co-authors), *Theoretical evaluation of magnetotransport properties in Co/Cu/Co-based spin-valves*, Physical Review B **65**, 134427 (2002).
171. Asya Shpiro, Shufeng Zhang (co-authors), *Transport in metallic multilayers with both specular and diffuse scattering at interfaces*, Materials Research Society Symposium Proceedings **690**, F11.3.1 (2002).
172. *The role of spin accumulation in current induced switching of magnetic layers, or the first 10^{-12} seconds in a magnetic multilayer after the current is switched on*, Journal of Physics D: Applied Physics **35**, 2448 (2002).
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174. Asya Shpiro, Shufeng Zhang (co-authors), *A self consistent treatment of non-equilibrium spin torques in magnetic multilayers*, Physical Review B **67**, 104430 (2003).
175. S. Gallego, P. Weinberger, L. Szunyogh, and C. Sommers (co-authors), *Ab initio description of domain walls in Permalloy: Energy of formation and resistivities*, Physical Review B **68**, 054406 (2003).
176. Jianwei Zhang, Shufeng Zhang and Vladimir Antropov (co-authors), *Identification of transverse spin currents in noncollinear magnetic structures*, Physical Review Letters **93**, 256602 (2004).
177. Jianwei Zhang (co-author), *Current induced spin flip scattering at interfaces in noncollinear magnetic multilayers*, Physical Review B **70**, 132406 (2004).
178. Jianwei Zhang (co-author), *The steady state in noncollinear magnetic multilayers*, Physical Review B **70**, 184442 (2004).
179. Jianwei Zhang (co-author), *Different steady states for spin currents in noncollinear multilayers*, J.Phys.: Condens. Matter **16**, S5601 (2004).
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183. Peter M Levy and Jianwei Zhang, *Erratum: Current-induced spin flip scattering at interfaces in noncollinear magnetic multilayers [Phys. Rev. B 70, 132406 (2004)]*, Physical Review B **73**, 069901(E) (2006).
184. Peter M Levy and Albert Fert, *Spin Transfer in Magnetic Tunnel Junctions with Hot Electrons*, Physical Review Letters **97**, 097205 (2006).
185. Peter M Levy and Albert Fert, *Effect of bias-induced spin flips on spin torque: Enhancement of current and spin transfer in magnetic tunnel junctions*, Physical Review B **74**, 224446 (2006).
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Conference Presentations

1. *The Anisotropy of the Rare-Earth-Iron Exchange Interaction in the Garnets*, San Francisco, Conference on Magnetism and Magnetic Materials, November, 1965.
2. *Shape Dependence of the Thermodynamic Properties of a Paramagnet*, Chicago, March Meeting of the American Physical Society, 1967. *Bulletin of the American Physical Society* **12**, 311 (1967).
3. *Shape Dependence of the Specific heat of Magnetic Systems with Long-Range Interactions*, Boston, International Congress on Magnetism, September, 1967.
4. *Anisotropy of the Two-Center Exchange Interaction*, Berkley, March Meeting of the American Physical Society, 1968. *Bulletin of the American Physical Society* **13**, 386 (1968).
5. *Isotropic Exchange and the Lande Interval Rule*, New York, Conference on Magnetism and Magnetic Materials, November, 1968.
6. *Anisotropy of Exchange Interactions for Nonorthogonal Orbitals*, Philadelphia, March Meeting of the American Physical Society, 1969. *Bulletin of the American Physical Society* **14**, 409 (1969).
7. *Indirect Exchange via Spin-Orbit Coupled States*, Philadelphia, Conference on Magnetism and Magnetic Materials, November, 1969.
8. *Rare-Earth Conduction Electron Exchange in Intermetallic Compounds*, Grenoble, France, International Conference on Magnetism, September, 1970. Chairman of session on *Theoretical Problems*.
9. *Exchange Scattering in Rare-Earth Dialuminides*, Miami, Conference on Magnetism and Magnetic Materials, November, 1970. Chairman of session on *Anisotropy and Magnetostriction*.
10. *Structural and Magnetic Phase Transitions in the Rare-Earth Pnictides*, Chicago, Conference on Magnetism and Magnetic Materials, November, 1971.
11. *High Temperature Series Expansions for Spin-One Ferromagnetism*, Denver, Conference on Magnetism and Magnetic Materials, November, 1972.
12. *Cooperative Jahn-Teller Effect in Dysprosium Antimonide*, Denver, Conference on Magnetism and Magnetic Materials, November, 1972.
13. *Quadrupolar Coupling and its Contribution to Electrical Resistivity*, (presented by M.J. Sablik), Denver, Conference on Magnetism and Magnetic Materials, November, 1972.
14. *Electrical Resistivity of Some Rare-Earth Antimonides*, Moscow, U.S.S.R., International Conference on Magnetism, August 1973.
15. *Tricritical Behavior of Holmium Antimonide*, (presented by L.F. Uffer), Boston, Conference on Magnetism and Magnetic Materials, November 1973.
16. *Effect of p-Wave Exchange Scattering on Resistivity in Magnetic Rare-Earth Intermetallics*, (presented by M.J. Sablik), Boston, Conference on Magnetism and Magnetic Materials, November 1973.
17. *Contributions of Fluctuations to Specific Heat of Tricritical Systems*, Philadelphia, March Meeting of the American Physical Society, 1974. *Bulletin of the American Physical Society* **19**, 307 (1974).
18. *Elementary Excitations of Spin-One Pair Interactions*, (Presented by S.T. Chiu-Tsao), Philadelphia, March Meeting of the American Physical Society, 1974. *Bulletin of the American Physical Society* **19**, 368 (1974).
19. *Quadrupole-Driven Tricritical Systems*, (presented by M.J. Sablik), Athens, APS Conference on Critical Phenomena in Multicomponent Systems, April 1974.

20. *Tricriticality of Cubic Rare-Earth Compounds*, San Francisco, Conference on Magnetism and Magnetic Materials, December 1974. AIP Conference Proceedings **24**, 289 (1975).
21. *Correction to Mean Field Description of Tricritical Systems*, San Francisco, Conference on Magnetism and Magnetic Materials, December 1974. AIP Conference Proceedings **24**, 289 (1975).
22. *Single-Ion Resonant States in Two-Spin Wave Spectra*, (presented by S.T. Chiu-Tsao), San Francisco, Conference on Magnetism and Magnetic Materials, December 1974. AIP Conference Proceedings **24**, 160 (1975).
23. *Anisotropy in the Quadrupole Part of s-f Scattering in Magnetically Ordered Systems*, (presented by M.J. Sablik), Washington, D.C., Meeting of the American Physical Society, 1975. Bulletin of the American Physical Society **20**, 586 (1975).
24. *Critical Behavior of the Cubic Model*, Budapest, Hungary, International Conference on Statistical Physics, August 1975.
25. *Ground and Excited State Spin Waves in Holmium Phosphide*, (presented by A. Furrer), Zurich, Switzerland, Second International Conference on Crystal Field Effects in Metals and Alloys, September 1976.
26. *Phase Behavior of a Variant of the 3-State Potts Model*, (presented by J.J. Sudano), Minneapolis, Conference on Magnetism and Magnetic Materials, November 1977. Journal of Applied Physics **49**, 1398 (1978).
27. *Magneto-Transport Properties of Noble Metals Containing Rare-Earth Impurities*, Minneapolis, Conference on Magnetism and Magnetic Materials, November 1977.
28. *Anisotropy from Quadrupole Scattering in Magnetically Ordered Rare-Earth Compounds*, (presented by M.J. Sablik) Minneapolis, Conference on Magnetism and Magnetic Materials, November 1977.
29. *Determination through Symmetry Arguments of the Various Contributions to the Self-Polarisation Field at Rare-Earth Nuclei in Cubic Symmetry* (presented by E. Belorizky), St. Pierre de Chartreuse, France, International C.N.R.S. Colloquium on Physics of Metallic Rare-Earths, September 1978.
30. *One Dimensional Cubic Spin Models with Competing Bilinear and Higher-Degree Pair Interactions in a Magnetic Field*, (presented by R. Raghavan) Cleveland, Conference on Magnetism and Magnetic Materials, November 1978.
31. *Mean Field Theories of Field Induced Transitions in DySb*, Chicago, March Meeting of the American Physical Society, 1979. Bulletin of the American Physical Society **24**, 302 (1979).
32. *Multipole Interactions in Rare-Earth Metals*, Chicago, March Meeting of the American Physical Society, 1979. Bulletin of the American Physical Society **24**, 490 (1979).
33. *Anisotropic k-f Interactions from Spin-Orbit Coupled 5d Intermediate States*, Munich, Germany, International Conference on Magnetism, September, 1979.
34. *Orbital and Spin Polarizations of Conduction Electrons in Rare-Earth Compounds*, Munich, Germany, International Conference on Magnetism, September, 1979.
35. *Multipolar Interactions in Metallic Rare-Earth Compounds*, Munich, Germany, International Conference on Magnetism, September, 1979.
36. *The Effects of Rare-Earth Impurities on the Magneto-Transport Properties of Noble Metals*, New York, March Meeting of the American Physical Society, 1980. Bulletin of the American Physical Society **25**, 344 (1980).

37. *Pseudo-Dipole Interactions in Transition Metal Spin-Glass Alloys*, Dallas, Conference on Magnetism and Magnetic Materials, November 1980.
38. *Anisotropy Fields in Transition Metal Spin Glass Alloys*, (presented by A. Fert) Rome, Italy, International Conference on Disordered Systems and Localization, May 1981.
39. *Resistivity Anisotropy in PrAl₂ via Quadrupole Scattering*, (presented by M.J. Sablik), Montréal, Canada, Conference on Magnetism and Magnetic Material, July 1982.
40. *Ab-Initio Calculation of Indirect Multipolar Interactions in a Rare-Earth Intermetallic Compound*, Kyoto, Japan, International Conference on Magnetism, September 1982.
41. *ESR Linewidth in Spin Glasses Above T_g*, Kyoto, Japan, International Conference on Magnetism, September 1982.
42. *Quadrupole Induced Spontaneous Anisotropy of the Resistivity in PrAl₂*, Kyoto, Japan, International Conference on Magnetism, September 1982.
43. *Origin of Anisotropy in Binary Spin Glass Alloys*, Los Angeles, March Meeting of the American Physical Society, March 1983. Bulletin of the American Physical Society **28**, 510 (1983).
44. *Spin-Orbit Scattering of Conduction Electrons by Gold Impurities*, (presented by S.M. Goldberg), Los Angeles, March Meeting of the American Physical Society, March 1983. Bulletin of the American Physical Society **28**, 510 (1983).
45. *The RKKY Interaction and Spin Glasses*, Edinburgh, Scotland, International Conference on Thermodynamics and Statistical Mechanics, July 1983.
46. *Theory of Electron Spin Resonance in the Insulating Spin Glass: Europium Strontium Sulfide*, San Diego, Conference on Magnetism and Magnetic Materials, November 1984.
47. *Magnetic Coupling between Local Moments in Metals*, Baltimore, March Meeting of the American Physical Society, March 1985. Bulletin of the American Physical Society **30**, 645 (1985).
48. *Effect of Spin-Orbit Scattering on the Spin Glass Temperature*, San Francisco, International Conference on Magnetism, August 1985.
49. *Are ESR Lines in Spin Glasses Exchange Narrowed?*, San Francisco, International Conference on Magnetism, August 1985.
50. *Long Range Interactions and the Spin Glass Temperature*, San Francisco, International Conference on Magnetism, August 1985.
51. *Theory of the Hall Effect in Heavy Fermion and Mixed Valence Systems*, Grenoble, France, International Conference on Anomalous Rare Earths and Actinides, July 1986.
52. *Hall Effect in Heavy Fermion Compounds*, Baltimore, Conference on Magnetism and Magnetic Materials, November 1986.
53. *Skew Scattering in Kondo Systems*, New York, March Meeting of the American Physical Society, March 1987. Bulletin of the American Physical Society **32**, 762 (1987).
54. *Hall Effect for Kondo Systems*, Chicago, Conference on Magnetism and Magnetic Materials, November 1987.
55. *Spin-Flip Contribution to the Hall Effect in Kondo Systems*, (presented by Wei Guo), New Orleans, March Meeting of the American Physical Society, March 1988. Bulletin of the American Physical Society **33**, 401 (1988).

56. *Effects of Crystal Field on Hall Effect in Kondo Systems*, Frankfurt a/m, Federal Republic of Germany, Sixth International Conference on Crystal Field Effects and Heavy Fermion Physics, July, 1988.
57. *Anisotropic Mixing in Kondo Systems*, Frankfurt a/m, Federal Republic of Germany, Sixth International Conference on Crystal Field Effects and Heavy Fermion Physics, July, 1988.
58. *The Hall Effect in Kondo Systems*, Paris, France, International Conference on Magnetism, July, 1988.
59. *Anisotropy of Resistivity and Susceptibility of Cerium Kondo Systems Due to Mixing*, St. Louis, March Meeting of the American Physical Society, 1989. Bulletin of the American Physical Society **34**, 994 (1989).
60. *Longitudinal Jumps in Kondo Systems*, (presented by S. Zhang) Boston, Conference on Magnetism and Magnetic Materials, November, 1989.
61. *Long Range Antiferromagnetic Coupling in Fe/Cr Multilayered Structures*, Strasbourg, France, European Materials Research Society, May 1990.
62. *Transverse Conductivity of Multilayered Structures*, (presented by S. Zhang) San Diego, Conference on Magnetism and Magnetic Materials, October 1990.
63. *Interlayer Magnetic Coupling in Transition-Metal Multilayered Structures*, (presented by J.L. Fry) San Diego, Conference on Magnetism and Magnetic Materials, October 1990.
64. *Magneto-resistance of Magnetically Uncoupled Multilayered Structures*, Anaheim, Spring Meeting of the Materials Research Society, May 1991.
65. *Interlayer Magnetic Coupling in Transition-Metal Multilayered Structures*, Anaheim, Spring Meeting of the Materials Research Society, May 1991.
66. *Magnetic Multilayers: Quasi-classical Transport via the Kubo Formula*, (presented by H. E. Camblong), Conference on Magnetism and Magnetic Materials, Houston, December 1-4, 1992.
67. *Spin Polarization in Paramagnetic Layers on Magnetic Substrates*, (presented by Z. P. Shi), Conference on Magnetism and Magnetic Materials, Houston, December 1-4, 1992.
68. *Influence of Potential Barriers on Magneto-resistance of Magnetic Multilayers*, Conference on Magnetism and Magnetic Materials, Houston, December 1-4, 1992.
69. *Interlayer Magnetic Coupling*, (presented by Z. P. Shi), March Meeting of the American Physical Society, Seattle, March 22-26, 1993. Bulletin of the American Physical Society **38**, 442 (1993).
70. *Effect of Superlattice Potentials on Magneto-resistance*, Spring Meeting of the Materials Research Society, San Francisco, April 12-16, 1993.
71. *Theory of Magnetotransport in Inhomogeneous Magnetic Structures* (presented by H. E. Camblong), Conference on Magnetism and Magnetic Materials, Minneapolis, November 15-18, 1993.
72. *Effective Internal Fields and Magnetization Buildup for magnetotransport in magnetic Multilayered Structures*, Conference on Magnetism and Magnetic Materials, Minneapolis, November 15-18, 1993.
73. *Effects of Domains on Giant Magneto-resistance*, March Meeting of the American Physical Society, Pittsburgh, March 21-25, 1994. Bulletin of the American Physical Society **39**, 181 (1994).
74. *Antiferromagnetic Bias in Interlayer Coupling* (presented by Z. P. Shi), March Meeting of the American Physical Society, Pittsburgh, March 21-25, 1994. Bulletin of the American Physical Society **39**, 281 (1994).

75. *Antiferromagnetic Bias in Interlayer Magnetic Couplings*, International Conference on Magnetism 1994, Warsaw, Poland, August 22-26, 1994.
76. *Theory of Magnetotransport: Beyond the Local Relaxation Time Approximation*, 14th International Colloquium on Magnetic Films and Surfaces, Düsseldorf, Germany, August 29 - September 2, 1994.
77. *Effects of Domains on Giant Magnetoresistance*, 14th International Colloquium on Magnetic Films and Surfaces, Düsseldorf, Germany, August 29 - September 2, 1994.
78. *A New Geometry for Giant Magnetoresistance of Layered Structures*, March Meeting of the American Physical Society, San Jose, March 20-24, 1995. Bulletin of the American Physical Society **40**, 145 (1995).
79. *Quantum Well States in Metallic Superlattices*, March Meeting of the American Physical Society, San Jose, March 20-24, 1995. Bulletin of the American Physical Society **40**, 412 (1995).
80. *Magnetotransport Theory: A View Towards Applications*, ARPA Workshop on Magnetic Materials and Devices, Washington, D.C., May 16, 1995.
81. *The Role of Electronic Structure in Giant Magnetoresistance*, 2nd International Symposium on Metallic Multilayers, UK, September 14, 1995.
82. *Currents at Angles to the Plane of the Layers*, Conference on Magnetism and Magnetic Materials, Philadelphia, November 9, 1995.
83. *Electrical Conductivity of Disordered Semi-infinite Systems*, March Meeting of the American Physical Society, St. Louis, March 18-22, 1996. Bulletin of the American Physical Society **41**, 201 (1996).
84. *Angular Dependence of GMR in Superlattices* (presented by K. Wang), March Meeting of the American Physical Society, St. Louis, March 18-22, 1996. Bulletin of the American Physical Society **41**, 305 (1996).
85. *Magnetoresistance with Short-range Order Interfaces* (presented by S. Zhang), March Meeting of the American Physical Society, St. Louis, March 18-22, 1996. Bulletin of the American Physical Society **41**, 306 (1996).
86. *Resistivity Due to Domain Wall Scattering*, March Meeting of the American Physical Society, Kansas City, March 17-21, 1997. Bulletin of the American Physical Society **42**, 569 (1997).
87. *Interplay of the specular and diffuse scattering at interfaces of magnetic multilayers* (presented by S. Zhang), March Meeting of the American Physical Society, Kansas City, March 17-21, 1997. Bulletin of the American Physical Society **42**, 568 (1997).
88. *Magnetoresistance in Magnetic Tunnel Junctions*, 7th Joint Magnetism and Magnetic Materials-Intermag Conference, San Francisco, January 7, 1998.
89. *Reduction of Magnetoresistance by Hot Electrons in Magnetic Tunnel Junctions* (presented by S. Zhang), 7th Joint Magnetism and Magnetic Materials-Intermag Conference, San Francisco, January 7, 1998.
90. *Magnetoresistance due to Domain Walls in Micron Scale Fe Wires with Stripe Domains* (presented by A.D. Kent), 7th Joint Magnetism and Magnetic Materials-Intermag Conference, San Francisco, January 7, 1998.
91. *Ab-initio calculations of the giant magnetoresistance for interdiffused Cu(100)/CuCoCu/Cu(100) systems* (presented by C. Blaas), March Meeting of the American Physical Society, Los Angeles, March 16-20, 1998. Bulletin of the American Physical Society **43**, 543(1998); 3rd Conference on Metallic Multilayers (MML'98), Vancouver, Canada, June 15-19, 1998.

92. *Magnetoresistance due to Domain Walls in Fe Wires with Controlled Stripe Domains* (presented by A.D. Kent), March Meeting of the American Physical Society, Los Angeles, March 16-20, 1998. Bulletin of the American Physical Society **43**, 543(1998).
93. *Range Dependence of Interlayer Coupling*, 3rd Conference on Metallic Multilayers (MML'98), Vancouver, Canada, June 15-19,1998.
94. *Magnetoresistance of Epitaxially Oriented Ferromagnetic Nanowires*, (presented by A.D. Kent), 3rd Conference on Metallic Multilayers (MML'98), Vancouver, Canada, June 15-19,1998.
95. *Effect of Electronic Structure on Magnetic Tunneling*, 3rd Conference on Metallic Multilayers (MML'98), Vancouver, Canada, June 15-19,1998.
96. *Effects of a non-magnetic layer in magnetic tunnel junctions*, Conference on Magnetism and Magnetic Materials, Miami, November 9-12, 1998.
97. *Ab-initio calculation of magnetoresistance in tunnel junctions*, Conference on Magnetism and Magnetic Materials, Miami, November 9-12, 1998.
98. *Voltage driven magnetization in magnetic tunnel junctions*, March Meeting of the American Physical Society,Atlanta, March 20-26, 1999. Bulletin of the American Physical Society **44**, 1742, (1999).
99. *On the orientational dependence of the giant magnetoresistance*, March Meeting of the American Physical Society,Atlanta, March 20-26, 1999. Bulletin of the American Physical Society **44**, 1022 (1999).
100. *Resistivity of thin films*, (presented by H.E.Camblong), March Meeting of the American Physical Society,Atlanta, March 20-26, 1999. Bulletin of the American Physical Society **44**, JC 04.03 (1999).
101. *Resistance across an interface and that measured far from it*, (presented by Asya Shpiro), March Meeting of the American Physical Society, Minneapolis, March 20-24, 2000. Bulletin of the American Physical Society **45**,157 (2000).
102. *Ab-initio determination of electrical transport properties of Ni_cFe_{1-c}alloys as thin films and in Spin-valves*, (presented by Peter Weinberger) March Meeting of the American Physical Society, Minneapolis, March 20-24, 2000. Bulletin of the American Physical Society **45**, 377 (2000).
103. *Theoretical evaluation of magnetotransport properties in Co/Cu/Co-based spin-valves*, (presented by Peter Weinberger) March Meeting of the American Physical Society, Minneapolis, March 20-24, 2000. Bulletin of the American Physical Society **45**, 447(2000).
104. *Ab-initio non-equilibrium calculation of magnetic tunnel junctions*. (presented by Christoph Uiberacker), The 8th Joint MMM-Intermag Conference, San Antonio, January 7-11, 2001.
105. *Current induced interlayer coupling*, March Meeting of the American Physical Society, Seattle, March12-16, 2001. Bulletin of the American Physical Society **46**,720 (2001).
106. *Transport in metallic multilayers with both specular and diffuse scattering at interfaces* (presented by Asya Shpiro), March Meeting of the American Physical Society, Seattle, March12-16, 2001. Bulletin of the American Physical Society **46**, 97 (2001).
107. *Perpendicular transport in Fe/Ge heterostructures* (presented by Peter Weinberger), March Meeting of the American Physical Society, Seattle, March12-16, 2001. Bulletin of the American Physical Society **46**, 351 (2001).

108. *Interlayer exchange coupling and electrical transport in Fe/Cr multilayers* (presented by Charles Sommers), March Meeting of the American Physical Society, Seattle, March12-16, 2001. Bulletin of the American Physical Society **46**, 1246 (2001).
109. *Electrical transport properties of bulk Ni_xFe_{1-x} alloys and related spin-valve systems* , March Meeting of the American Physical Society, Seattle, March12-16, 2001. Bulletin of the American Physical Society **46**, 351 (2001).
110. *Mechanisms for current induced switching of magnetic layers*, 4th International Symposium on Metallic Multilayers (MML'01), Aachen, Germany, June 26, 2001.
111. *Transverse spin accumulation in the 3d transition-metal ferromagnets*, (presented by Jianwei Zhang) March Meeting of the American Physical Society, Seattle, March 3-7, 2003. Bulletin of the American Physical Society **48**, 117 (2003).
112. *The "s-d" exchange coupling in the 3d transition-metal ferromagnets*, (presented by Jianwei Zhang) March Meeting of the American Physical Society, Seattle, March 3-7, 2003. Bulletin of the American Physical Society **48**, 821 (2003).
113. *Transverse spin currents in the 3d transition-metal ferromagnets* (presented by Shufeng Zhang) Workshop on Spin Mesoscopics, University of Twente, Enschede, The Netherlands, March 15, 2003.
114. *The spin transfer region in noncollinear magnetic multilayers* (presented by Jianwei Zhang) 49th Annual Conference on Magnetism and Magnetic Materials, Jacksonville, November 7-11,2004.

Invited Talks (1967-)

1. *Shape Dependence of the Thermodynamic Properties of Magnetic Systems*, University of Minnesota, November, 1967.
2. *Développements récents sur la théorie des interactions d'échange anisotrope*, (in French) Laboratoire d'Electrostatique et de Physique du Metal, Grenoble, France, July, 1968.
3. *Some Recent Developments on Anisotropic Exchange Interactions*, Lehrstuhl fur Theoretische Festkorperphysik der Technischen Hochschule, Darmstadt, Germany, July, 1968.
4. *Recent Developments in the Theory of Anisotropic Exchange*, International Conference on Magnetic Oxides, Bucharest, Romania, September, 1968.
5. *Anisotropic Exchange*, Michigan State University, East Lansing, February, 1969.
6. *Shape Dependence of the Thermodynamic Properties of Magnetic Systems*, Drexel Institute of Technology, Philadelphia, May 1969.
7. *Shape Dependence of the Thermodynamic Properties of Magnetic Systems*, New York University, New York, May, 1969.
8. *Shape Dependence of the Thermodynamic Properties of Magnetic Systems*, University of Georgia, Athens, April, 1970.
9. *Shape Effects in Magnetic Systems*, Brookhaven National Laboratory, Upton, Long Island, June, 1970.
10. *Shape Dependence of the Thermodynamic Properties of Magnetic Systems*, University of Parma, Parma, Italy, September 1970.
11. *High-Degree Pair Interactions in Magnetic Materials*, State University of New York at Albany, Albany, December 1970.
12. *Néel: Magnetism and Grenoble*, New York Meeting of the American Physical Society, February, 1971.
13. *High-Degree Exchange Interactions*, Princeton University Conference on Exchange Interactions Between Ions in Crystals and Molecules, Princeton, May, 1971.
14. *High-Degree Pair Interactions in Magnetic Materials*, University of Wisconsin, Milwaukee, May, 1971.
15. *Double Phase Transitions in Rare-Earth Compounds*, Oak Ridge National Laboratory, Oak Ridge, Tennessee, February 24, 1972.
16. *Orbital Contributions to the Transferred Hyperfine Fields in Rare-Earth Compounds*, B.D. Dunlap and I. Nowik (co-authors), International Conference on Hyperfine Interactions in Magnetically Ordered Systems, L'Aquila, Italy, September 1972.
17. *Search for High-Degree Pair Interactions in Real Systems*, City College of New York, New York, May 1, 1973.
18. *Phase Transitions in Magnetic Systems Described by Higher-Degree Pair Interactions*, Series of 3 lectures presented at International Summer School on Critical Phenomena and Phase Transitions in Magnetism, Cetniewo, Poland, August-September 1973.
19. *Elementary Excitations of Higher-Degree Pair Interactions in Rare-Earth Compounds*, Series of 2 lectures presented at XIth Annual Winter School of Theoretical Physics, Karpacz, Poland, February 1974.

20. *Quadrupole-Driven Tricritical Systems*, Institut für Reaktorforschung, Würenlingen, Switzerland, February 19, 1974.
21. *Quadrupole-Driven Tricritical Systems*, State University of New York, Stony Brook, New York, March 21, 1974.
22. *Cubic Rare-Earth Compounds: Physical Realization of a Potts Model*, Yale University, New Haven, Connecticut, January 24, 1975.
23. *Comportement Critique des Composés Cubiques des Terres Rares*, Laboratoire de Magnétisme, C.N.R.S., Grenoble, France, October 12, 1975.
24. *Critical Behavior of Cubic Rare-Earth Compounds*, Lehrstuhl für Theoretische Festkörperphysik, Technische Hochschule Darmstadt, Germany, November 4, 1975.
25. *Elementary Excitations of Systems with Orbital Degeneracy*, Institut für Festkörperforschung der Kernforschungsanlage, Jülich, Germany, November 7, 1975.
26. *Comportement Critique du modèle cubique. Applications aux Terres Rares*, Laboratoire de Physique des Solides, Université de Paris-Sud, Orsay, France, November 25, 1975.
27. *Phase Transitions in Magnetic Materials*, École Nationale Supérieure de Chimie de Paris, France, January 16, 1976.
28. *Comportement Critique des Composés Cubiques des Terres Rares*, Laboratoire de Physique des Solides, I.N.S.A. Toulouse, France, January 29, 1976.
29. *Critical Behavior in Cubic Rare-Earth Compounds*, Eidgenössische Technische Hochschule Zürich, Switzerland, February 19, 1976.
30. *The Critical Behaviour of the Cubic Model*, Laboratorium voor Technische Natuurkunde, Technische Hogeschool Delft, April 6, 1976.
31. *The Cubic Model and the Critical Behaviour of Cubic Rare-Earth Compounds*, Instituut Lorentz voor Theoretische Natuurkunde, Rijks-Universiteit te Leiden, Holland, April 7, 1976.
32. *Elementary Excitations in Systems with High-Degree Pair Interactions*, Natuurkundig Laboratorium der Universiteit van Amsterdam, Holland, April 8, 1976.
33. *Elementary Excitations in Systems with High-Degree Pair Interactions*, Fysisch Laboratorium, Rijks-Universiteit Utrecht, Holland, April 9, 1976.
34. *Échange Anisotrope*, Laboratoire d'Optique Physique, École de Physique et de Chimie Industrielle, Paris, France, May 10, 1976.
35. *Elementary Excitations in Systems with Orbital Degeneracy*, Department of Physics, University of Oxford, England, June 3, 1976.
36. *Magnetic Octupole Scattering of Neutrons*, Danish A.E.C. Research Establishment Riso, Roskilde, Denmark, June 29, 1976.
37. *Critical Behavior of a Variant of the Potts Model*, Nordita, Copenhagen, Denmark, June 30, 1976.
38. *What Magneto-Transport Measurements in Noble Metals with Rare-Earth Impurities Tell Us About the Rare-Earth 5d Electrons*, Department of Physics, Carnegie-Mellon University, Pittsburgh, January 27, 1978.

39. *Anisotropic Coulomb and Exchange Interactions in Metallic Rare-Earth Systems*, International C.N.R.S. Colloquium on Physics of Metallic Rare-Earths, St. Pierre de Chartreuse, France, September 4, 1978.
40. *Multipolar Interactions in Metallic Rare-Earth Compounds*, Laboratoire de Cristallographie C.N.R.S., Grenoble, France, January 23, 1979.
41. *Multipolar f-Electron-Conduction Band Interactions in Rare-Earth Compounds*, International Conference on Crystalline Electric Field and Structural Effects in f-Electron Systems, Philadelphia, November 14, 1979.
42. *Multipolar k-f Interactions in Metallic Rare-Earth Compounds*, Polytechnic Institute of New York, New York, December 6, 1979.
43. *Multipolar f-Electron-Conduction Band Interactions in Rare-Earth Compounds*, Ohio State University, Columbus, March 6, 1980.
44. *What Magneto-Transport Measurements Tell Us About the Anisotropic f Electron-Conduction Electron Interaction in Metallic Systems*, IBM Thomas J. Watson Research Center, Yorktown Heights, April 3, 1980.
45. *Anisotropy of Spin Glasses*, Laboratoire de Physique des Solides, Université de Paris-Sud, Orsay, France, June 15, 1981.
46. *The Anisotropy of Spin Glasses*, Institut für Reaktortechnik, ETH-Zurich, Würenlingen, Switzerland, June 22, 1981.
47. *Origin of Anisotropy in Transition Metal Spin Glass Alloys*, Conference on Magnetism and Magnetic Materials, Atlanta, November 1981.
48. *L'anisotropie dans les Verres de Spins*, Laboratoire Louis Néel, C.N.R.S., Grenoble, France, January 21, 1982.
49. *Anisotropy in Transition Metal Spin Alloys*, Department of Physics, City College of New York, New York, April 28, 1982.
50. *The Origin of Anisotropy in Spin Glasses*, Laboratory of Atomic and Solid State Physics, Cornell University, May 6, 1982.
51. *Electron Spin Resonance in Metallic Spin Glasses Above the Glass Temperature*, University of Illinois, Urbana, April 15, 1983.
52. *Theory of ESR in Spin Glasses Above T_g* , II^{eme} Rencontre sur les Verres de Spin, Orsay, France, January 23, 1984.
53. *Indirect Interactions Between Magnetic Impurities in a Metal*, Colloquium Ehrenfestii, Instituut-Lorentz Leiden, Holland, February 1, 1984.
54. *Spin Resonance in Metallic Spin Glasses Above the Glass Temperature*, Laboratoire d'Electronique, Université d'Aix-Marseille, March 27, 1984.
55. *Interactions Between Magnetic Impurities in Metals*, Europaisches Festkörperkolloquium, Physikalisches Institut der Frankfurt, Germany, May 17, 1984.
56. *Magnetic Couplings Between Impurities*, Institut für Reaktortechnik, ETH-Zurich, Würenlingen, Switzerland, May 25, 1984.
57. *Long Range Interactions Between Magnetic Impurities in Metals*, Department of Physics, Polytechnic Institute of New York, March 8, 1985.

58. *Long Range Interactions Between Local Moments in Metals*, Department of Physics, City College of New York, November 6, 1985.
59. *Coherence in Heavy Fermion Compounds*, Department of Physics, Stevens Institute of Technology, March 12, 1986.
60. *Anisotropy in Kondo Systems*, The Sir Roger Elliott 60th Birthday Symposium, Oxford, England, July 11, 1989.
61. *Theory of Magnetic Superlattices: Interlayer Exchange Coupling and Magnetoresistance of Transition Metal Structures*, Conference on Magnetic and Magnetic Materials, Boston, December 1, 1989.
62. *Magnetotransport in Metallic Superlattices*, Temple University, Philadelphia, February 5, 1990.
63. *Magnetoresistance in Magnetic Superlattices*, Bell Communication Research, Red Bank, New Jersey, March 23, 1990.
64. *Magnetism: What Do We Need to Know*, Workshop on Magnetism and Synchrotrons, Brookhaven National Laboratory, Upton, New York, May 16, 1990.
65. *Theory of Magnetoresistance in Magnetic Superlattices*, European Material Research Society, Strasbourg, France, May 30, 1990.
66. *Magnetotransport Properties of Metallic Superlattices*, Michigan State University, East Lansing, January 14, 1991.
67. *Magnetoresistance in Multilayered Structures*, Texas A. & M., College Station, February 13, 1991.
68. *Magnetotransport Properties of Metallic Superlattices*, University of Texas at Arlington, Arlington, February 15, 1991.
69. *Magnetoresistance in Artificial Superlattices*, Institute for Chemical Research, Kyoto University, Japan, March 4, 1991.
70. *Magnetoresistance in Artificial Superlattices*, International Symposium on 3d Transition-Semi-Metal Thin Films, Akyu (Sendai), Japan, March 8, 1991.
71. *Magnetoresistance in Artificial Superlattices*, Tohoku University, Sendai, Japan, March 11, 1991.
72. *Magnetoresistance in Artificial Superlattices*, NEC Research Laboratories (Miyazakidai) Tokyo, Japan, March 13, 1991.
73. *Magnetoresistance in Artificial Superlattices*, Hitachi Central Research Laboratories, Kokubunji, Tokyo, Japan, March 14, 1991.
74. *Interlayer Coupling and Magnetoresistance in Transition Metal Multilayered Structures*, National Institute of Standards and Technology, Gaithersburg, July 29, 1991.
75. *Interlayer Coupling in Transition Metal Multilayers*, Naval Research Laboratories, Washington, DC, August 16, 1991.
76. *Magnetoresistance and Interlayer Coupling in Transition Metal Multilayers*, International Workshop on Spin-Valve Layered Structures, Madrid, Spain, September 11, 1991.
77. *Magnetoresistance of Metallic Superlattices*, University of California at Berkeley, January 29, 1992.
78. *Magnetoresistance of Metallic Superlattices*, Physical Sciences Colloquium, IBM Almaden Research Center, San Jose, California, January 31, 1992.

79. *Interlayer Magnetic Coupling in Transition Metal Multilayers*, Solid State Seminar, Brookhaven National Laboratory, Upton, Long Island, February 13, 1992.
80. *Theory of Giant Magnetoresistance*, March Meeting of the American Physical Society, March 20, 1992, Bulletin of the American Physical Society **37**, 683 (1992).
81. *Magnetoresistance and Interlayer Coupling in Metallic Superlattices*, University of Michigan, Ann Arbor, April 9, 1992.
82. *Magnetoresistivity of Multilayers for Current in Plane and Perpendicular to the Plane of the Layers*, US - Japan Seminar on Magnetic Multilayered Structures, Poipu Beach, Kauai, Hawaii, May 16, 1992.
83. *The Influence of Magnetism and Structure on Transport Properties and Interlayer Coupling of Systems in Reduced Dimensions*, NATO Advanced Research Workshop: "Magnetism and Structure in Systems of Reduced Dimensions"; Cargèse, Corsica, France, June 16, 1992.
84. *Magnétorésistance de Multicouches de Métaux de Transition*, Centre d'Etudes Nucleaires, Grenoble, France, September 3, 1992.
85. *Couplage Magnétique dans les Multicouches de Métaux de Transition*, Laboratoire Louis Néel, CNRS, Grenoble, France, September 4, 1992.
86. *Interlayer Coupling and Magnetoresistance of Multilayered Structures*, Symposium on Magnetic Ultra-Thin Films, Multilayers and Surfaces, Lyon, France, September 10, 1992.
87. *Magnetoresistance in Multilayers and Granular Solids*, Brown University, Providence, October 15, 1992.
88. *Giant Magnetoresistance in Magnetic Multilayers and Granular Films*, Polytechnic University, Brooklyn, N.Y., February 11, 1993.
89. *Magnetotransport in Layered and Granular Films*, Harvard University, Cambridge, April 30, 1993.
90. *Giant Magnetoresistance of Magnetically Layered and Granular Structures*, *Frontiers of Materials Sciences Lecture*, University of Pennsylvania, Philadelphia, May 14, 1993.
91. *Unified Transport Theory*, ARPA/ONR Workshop on Spin-Polarized Transport, Arlington, Virginia, September 14, 1993.
92. *Current Directions in Magnetic Multilayers*, Université de Montréal, Department of Physics, Montréal, Canada, May 16, 1994.
93. *Des Multicouches Métalliques Magnétiques*, Congrès de l'Association Canadienne-Française pour l'Avancement des Sciences, Montréal, Canada, May 17, 1994.
94. *Theory of Giant Magnetoresistance*, International Conference on Magnetism 1994, Warsaw, Poland, August 24, 1994.
95. *Spin-Polarized Transport in Layered and Granular Solids*, 5th NEC Symposium on Fundamental Approaches to New Material Phases: Spin-Dependent Phenomena in Multi-Layer Systems, Karuizawa, Japan, October 19, 1994.
96. *Giant Magnetoresistance of Nanostructured Materials*, Los Alamos National Laboratory, Los Alamos, New Mexico, December 19, 1994.
97. *Our Current Understanding of Giant Magnetoresistance in Transition - Metal Multilayers: the Vestiges of Electronic Structure*, International Workshop on Spin Polarized Electron Transport, Miami, Florida, February 20, 1995.

98. *Theory of Giant Magnetoresistance*, Tulane University, New Orleans, March 10, 1995.
99. *Giant Magnetoresistance*, Colloquium, Aspen Center for Physics, Aspen, Colorado, June 2, 1995.
100. *Magnetotransport in Transition - Metal Multilayers*, Magnetism in Multilayered and Reduced Dimensional Systems, Theory Workshop at Argonne National Laboratory, Argonne, Illinois, June 19, 1995.
101. *Electron Scattering from Metallic Interfaces*, Workshop on the Structure of Metallic Multilayers, Michigan State University, East Lansing, Michigan, July 10, 1995.
102. *Theory of Transport in Magnetic Systems*, IV International Conference on Advanced Materials - 1995, Cancun, Mexico, August, 29, 1995.
103. *Theory of Giant Magnetoresistance*, Eighth Chinese International Summer School of Physics, Beijing International Workshop on Modern Magnetism, Beijing, China, September 5, 1995.
104. *Giant Magnetoresistance in Magnetic Multilayers: Where are we?*, Ohio State University, Columbus, October 23, 1995.
105. *Giant Magnetoresistance in Magnetic Multilayers: Our Current Understanding and Open Questions*, Physics Department, Fudan University, Shanghai, China, November 20, 1995.
106. *Theory of Magnetic Multilayers I: A General Overview of the Origins and Our Current Understanding of GMR*, Department of Applied Physics, Nagoya University, Nagoya, Japan, November 24, 1995.
107. *Giant Magnetoresistance: Its Origins and Our Current Understanding*, Institute for Materials Research, Tohoku University, Sendai, Japan, November 27, 1995.
108. *GMR: Methodology and Open Questions*, Institute for Materials Research, Tohoku University, Sendai, Japan, November 28, 1995.
109. *Giant Magnetoresistance in Magnetic Multilayers; Our Current Understanding*, Department of Physics, Tokyo Metropolitan University, Tokyo, Japan, November 29, 1995.
110. *Giant Magnetoresistance: Our Current Understanding and Open Questions*, Institute for Chemical Research, Kyoto University, November 30, 1995.
111. *Theory of Magnetic Multilayers II: The Methodology of GMR*, Department of Applied Physics, Nagoya University, Nagoya, Japan, December 5, 1995.
112. *GMR: Our Current Understanding*, Department of Electronics, Nagoya University, Nagoya, Japan, December 8, 1995.
113. *Theory of Magnetic Multilayers III: Controversies and Open Questions about GMR*, Department of Applied Physics, Nagoya University, Nagoya, Japan, December 8, 1995.
114. *Theory of Giant Magnetoresistance in Magnetic Multilayers*, International Symposia on Advanced Materials and Technology for the 21st Century, the 117th Meeting of the Japan Institute of Metals, Honolulu, Hawaii, December 14, 1995.
115. *Current Status of our Understanding of Giant Magnetoresistance*, Department of Physics and Astronomy Colloquium, Johns Hopkins University, Baltimore, May 2, 1996.
116. *Giant Magnetoresistance*, Colloquium Department of Physics, University of Utah, Salt Lake City, May 23, 1996.

117. *GMR: Controversies and Open Questions*, Solid State Seminar, University of Utah, Salt Lake City, May 24, 1996.
118. *Giant MR*, Theory Colloquium, Technical University Dresden, Germany, July 9, 1996.
119. *Magnetoresistance due to Interfaces in Metallic Multilayers*, Condensed Matter Physics Seminar, University of North Carolina, Chapel Hill, September 19, 1996.
120. *Electron Transport in Magnetic Multilayers*, Physics Colloquium, University of North Carolina, Chapel Hill, September 20, 1996.
121. *Magnetoresistance from Interfaces in Metallic Multilayers*, Condensed Matter Physics Seminar, University of Florida, Gainesville, October 28, 1996.
122. *Towards a Theoretical Understanding of GMR in Layered Structures*, GMR Modelling Workshop, University of Virginia, Charlottesville, VA December 2, 1996.
123. *Spin Dependent Transport in Magnetic Multilayers and Tunnel Junctions*, Condensed Matter Seminar, IBM T.J. Watson Research Center, Yorktown Heights, NY, May 2, 1997.
124. *Fundamental Limits to Small Scale Magnetoresistive Memory and Sensors*, SpinTronics Workshop, Mesa Pavilion Hilton, Mesa, Arizona, May 29, 1997.
125. *Spin Dependent Tunneling: Its Creation and Destruction*, Laboratoire Centrale de Recherche, Thomson-CSF, Orsay, France, September 10, 1997.
126. *Spin Dependence of Tunneling Currents: How Its Achieved and Destroyed*, Institute for Materials Research, Tohoku University, Sendai Japan, September 29, 1997.
127. *Magnetotransport in Nanoscale Structures*, Institute for Materials Research, Tohoku University, Sendai Japan, October 20, 1997.
128. *Fundamental Limits to Small Scale Magnetoresistive Memory and Sensors*, Institute for Chemical Research, Kyoto University, Uji Japan, October 21, 1997.
129. *Fundamental Limits to Small Scale Magnetoresistive Memory and Sensors*, Department of Physics, Tokyo Metropolitan University, Japan, October 29, 1997.
130. *Electronic Structure of Magnetic Metal-Vacuum Interface Regions*, Réunion de Groupement de Recherche: Nanostructures Magnétiques sur "Transport polarisé en spin" CNRS-Gif sur Yvette, France, December 1, 1997.
131. *Tunnel Magnetoresistance*, Institut für Festkörperphysik und Werkstofforschung, Technische Universität Dresden, Germany, December 11, 1997.
132. *What Determines the Spin Dependence of Magnetic Tunnel Junctions*, Centre d'Etudes Nucleaires-Grenoble, France, February 4, 1998.
133. *Fundamental Limits to Small Scale Magnetoresistive Memory and Sensors*, Seminaire du Polygone, Laboratoire Louis Néel, Grenoble, France, February 5, 1998.
134. *Spin Dependence of Tunneling Currents: How Its Achieved and Destroyed*, WE Hearus Seminar on Spin Dependent Transport, Bad Honnef, Germany, February 16-18, 1998.
135. *The Origins of Magnetoresistance in Magnetic Tunnel Junctions*, Kammerlingh Onnes Laboratorium/ Instituut Lorentz, der Rijksuniversiteit te Leiden, Holland, March 31, 1998.
136. *Magnetoresistance of Magnetic Tunnel Junctions*, Technische Universiteit Delft, Holland, April 1, 1998.

137. *Fundamental Limits to Small Scale Magnetoresistive Memory and Sensors*, Technische Universiteit Eindhoven, Holland, April 2, 1998.
138. *Magnetoresistance in ferromagnetic tunnel junction junctions*, Department of Physics, Freie Universität, Dahlem, Berlin, Germany, April 24, 1998.
139. *Magnetic Tunnel Junctions: Origin of their Magnetoresistance*, Séminaire "Théoriciens" Université de Paris-Sud, Laboratoire de Physique des Solides, Orsay, France, April 30, 1998.
140. *Spin Dependent Tunneling*, Cavendish Laboratory, University of Cambridge, England, May 11, 1998.
141. *What Controls the Magnetoresistance of Magnetic Tunnel Junctions*, Department of Materials, University of Oxford, England, May 12th 1998.
142. *Fundamental Limits to Small Scale Magnetoresistive Memory and Sensors*, SpinTronics Workshop'98, Minneapolis, Minnesota, July 17, 1998.
143. *Spin-Polarized Transport in Multilayers and Tunnel Junctions*, Physics Department Colloquium, Stevens Institute of Technology, Hoboken, New Jersey, February 19, 1999.
144. *What Controls the Magnetoresistance of Magnetic Tunnel Junctions*, Spring 1999 Meeting of the Materials Research Society, San Francisco, California, April 8, 1999.
145. *Spin-dependent tunneling*, Laboratoire de Physique de la Matière Condensée, Ecole Normale Supérieure, Paris, France, June 21, 1999.
146. *Fundamental Limits to Small Scale Magnetoresistive Memory and Sensors*, SpinTronics Workshop'99, White Plains, New York, July 8, 1999.
147. *What Controls Spin Dependence of Currents in Magnetic Tunnel Junctions*, Département de Génie Physique et de Génie Matériaux, Ecole Polytechnique Montréal, Montréal, Canada, August 18, 1999.
148. *Magnetoresistance of Magnetic Tunnel Junctions*, 2.Physikalisches Institut, Rheinisch Westfälische Technische Hochschule, Aachen, Germany, October 11, 1999.
149. *Spin Polarized Electron Transport Phenomena*, WE Hearus Seminar on Electron Transport in Reduced Dimensions-Concepts and Reality, Bad Honnef, Germany, October 13, 1999.
150. *Magnetic tunnel junctions : status of the theory*, Gordon Research Conference on Magnetic Nanostructures, Ventura, California, February 13-18, 2000.
151. *What controls spin polarization of tunneling currents*, International Symposium on Nanoscale Magnetism and Transport, Sendai International Center, Sendai, Japan, March 8, 2000.
152. *What controls spin dependence of currents in magnetic tunnel junctions*, March Meeting of the American Physical Society, Minneapolis, Minnesota, March 22, 2000. Bulletin of the American Physical Society **45**, 581 (2000).
153. *Spin polarized currents in magnetic tunnel junctions*, Spring Meeting of Materials Research Society, San Francisco, California, April 24-28, 2000.
154. *Fundamentals of GMR*, European Conference on Magnetic Sensors and Actuators, Dresden, Germany, July 19, 2000.
155. *Plenary Lecture*, Magnetotransport in Multilayered Structures, PSI-K 2000 conference, Schwaebisch-Gmünd, Germany, August 26, 2000.
156. *Perpendicular transport in magnetically layered structures*, Institut fuer Festkoerperforschung

Forschungszentrum Juelich, October 25,2000 .

157. *Current induced interlayer coupling*, Research Training Network on Computational Magnetoelectronics Workshop on TMR and GMR, Dresden December 2, 2000.
158. *Theory of magnetotransport*, European Graduate School on Condensed Matter (EGSCM Prague'01) Prague, Czech Republic, June 11, 2001.
159. *Current induced switching of magnetic layers*, Institut fuer Festkoerperforschung Forschungszentrum Juelich, Germany, October 23,2001.
160. *Current induced switching of magnetic layers*, 2.Physikalisches Institut, Rheinisch Westfalische Technische Hochschule, Aachen, Germany, October 24, 2001.
161. *Current induced switching of magnetic layers*, lectures at Workshop on High Magnetoresistance Materials, International Centre for Condensed Matter Physics, Universida de Brasilia, Brazil, November 26-30, 2001.
162. *Current induced switching of magnetic layers*, Mini colloque in Halle December 11, 2001.
163. *Spin-polarized current-driven switching of magnetic layers*, 17th International Colloquium on Magnetic Films and Surfaces, Kyoto, Japan, March 8, 2002.
164. *The role of spin diffusion in current-driven switching of magnetic layers*, European Physical Society - Condensed Matter Physics, EPS-CMD19/CMMP 2002, Conference, Brighton, April 10, 2002.
165. *A diffusive approach to current induced magnetic switching*, Latsis Symposium 2002, "Spin Injection Induced Magnetization Reversal" Ecole Polytechnique Federale de Lausanne, Lausanne July 4, 2002.
166. *Introduction to transport in magnetic nanostructures* , Conference on The Science and Technology of Spin Transport in Nanostructures , the Abdus Salam International Centre for Theoretical Physics, Trieste, August 21,2002.
167. *A diffusive approach to CIMS, or developing spin torque in the same manner as we did CPP-MR*, Annual meeting of the Research Training Network on Computational Magnetoelectronics, Ile d' Oléron, France, October 5, 2002.
168. *Magnetotransport in Magnetic Multilayers*, Pan American Advanced Studies Institute on Physics at the Nanometer Scale, San Carlos de Bariloche, Argentina, June 9-10, 2003.
169. *How spin currents traverse magnetic multilayers when they are noncollinear*, Department of Applied Physics, Nagoya University, Japan, October 7, 2003.
170. *On the origin of spin torques in magnetic multilayers*, Department of Materials Engineering Science, Osaka University, Japan, October 8, 2003.
171. *Transverse spin currents in noncollinear magnetic multilayers*, Institute for Materials Research, Tohoku University, Sendai, Japan, October 22, 2003.
172. *Transverse spin currents in noncollinear magnetic multilayers*, RIKEN (The Institute of Physical and Chemical Research), Wako-Saitama, Japan, October 24, 2003.
173. *Conveying the basic concepts of electron transport in magnetic media to different audiences*, Institute for Materials Research, Tohoku University, Sendai, Japan, October 28, 2003.
174. *Transverse spin currents in noncollinear magnetic multilayers*, Condensed Matter Physics Seminar, Michigan State University, East Lansing, December 1, 2003.

175. *Spin currents in noncollinear magnetic structures: when linear response goes beyond equilibrium states*, Physics Colloquium, City College of New York, New York, October 27, 2004.
Two views of spin transfer and their reconciliation:
176. CNRS-Thales, Orsay, France, January 13, 2005.
177. SPINTEC, Centre d'Etudes Atomique, Grenoble, France, January 21, 2005.
178. Physics Department, Martin Luther Universitat, Halle, Germany, February 2, 2005.
179. Theory Seminar, Technical University Delft, The Netherlands, February 17, 2005.
180. *Spin transport in domain walls*, Tohoku University / UMR CNRS-Thales Workshop "Trends in Spintronics", Domaine de Corbeville, Orsay France, March 22, 2005.
181. *Spin currents in magnetic multilayers : what's well, little and unknown*, Thales Research Center, Palaiseau, France November 6, 2006.
182. *Spin torque due to transfer of angular momentum between noncollinear magnetic electrodes and hot electron spin currents*, ATI International Workshop and IFCAM International Workshop on Spin Currents, Sendai Japan, February 20, 2007.
183. *Les courants de spin-leur utilité, or Spin currents-their utility*, Laboratoire de Physique des Matériaux, Université de Nancy, France, April 5, 2007.
184. *The origins of spintronics and a current example of its utility*, Institute for Chemical Research, Kyoto University, Uji, Japan, April 17, 2007.
185. *A comparison of spin currents in non-collinear magnetic tunnel junctions with those in metallic multilayers*, Quantum Nano-scale Magnetism Laboratory FRS RIKEN, Wako-Saitama, Japan, April 20, 2007.
186. *An idiosyncratic survey of Spintronics: from 1963 to the present*, Physics colloquium Texas A&M, College Station, October 18, 2007.
187. *The Nobel Prize in Physics 2007: Giant Magnetoresistance*, Physics colloquium, City College of New York, February 27th 2008.