

A. CURRICULUM VITAE

M. Chshiev

I. Personal data :

Name: Mairbek Chshiev
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II. Education and Degrees:

Diploma: **Habilitation à diriger des recherches**
Date of obtention: 10/12/2008
Place of obtention: Université Joseph Fourier, Grenoble, France
Title: «Quantum description of spintronic phenomena in magnetic tunnel junctions»
Jury: A. Fert, J. Miltat, J. Moodera, O. Mryasov, C. Lacroix, D. Mayou

Diploma: **Ph.D. in Physics**
Date of obtention: 16/10/1997
Place of obtention: Moscow Lomonosov State University, Moscow, Russia
Titre: «Theory of giant magnetoresistance in magnetic multilayers and granular alloys»
PhD advisor: Prof. A. Vedyayev

Diploma: **Master in Physics**
Date of obtention: 14/06/1993
Place of obtention: North Ossetian State University, Russia
(*Specialisation in theoretical physics*)

III. Academic Experience:

Dates	Etablissement	Lieu	Fonctions
09/2012-	Université Joseph Fourier	Grenoble, France	Full Professor, Theory group leader at Spintec
09/2011- 08/2012	Université Joseph Fourier	Grenoble France	Professeur associé, Theory group leader at Spintec
05/2008- 08/2011	Fondation Nanosciences (RTRA), Laboratoire SPINTEC	Grenoble, France	Chair of Excellence
08/2004- 05/2010	University of Alabama, Center for Materials for Information Technology (MINT Center)	Tuscaloosa, Alabama, USA	Research Scientist, Adjunct. Assoc. Professor
06/2007- 08/2007	Université Henri Poincaré – Nancy, Laboratoire de Physique des Matériaux	Nancy, France	Invited Professor
09/2002- 07/2004	Virginia Polytechnic Institute and State University (Virginia Tech)	Blacksburg, Virginia, USA	Postdoc
09/2001- 08/2002	Université Louis Pasteur	Strasbourg, France	Full time teaching and research position (ATER à plein temps)
03/2000- 08/2001	Institut de Physique et Chimie des Matériaux de Strasbourg, Groupe d'étude des matériaux métalliques	Strasbourg, France	Postdoc
09/1998- 06/1999	Commissariat à l'énergie atomique (CEA), Département de Recherche Fondamentale sur la Matière Condensée (DRFMC), Laboratoire de Nanostructures et de Magnétisme (SP2M/NM)	Grenoble, France	Postdoc
09/1994- 11/1997	Moscow Lomonosov State University, Faculty of Physics, Magnetism Division	Moscow, Russia	PhD student

IV. Scientific Projects:

- Holder of Chair of Excellence RTRA “Nanosciences aux limites de la nanoélectronique” (Fondation Nanosciences) with the Project «Modélisation théorique des phénomènes intervenant dans les composants spintroniques», Grenoble, France (2008-2011)
- Coordinator (PI) of the Projet «Simulation of Graphene-based Nanomaterials and Nanodevices : Multiscale Approaches» (NANOSIM_GRAPHENE) supported by French Agence Nationale de la Recherche (2009-2013)
- Responsable (Co-PI) of the Projet «Crystalized SrTiO₃ for ultra-low RA magnetic tunnel junctions» (CRYSTO) supported by French Agence Nationale de la Recherche (2010-2012)
- PI of the Projet “Spin-Dependent Transport in Magnetic Multilayers” at U. S. DOE Nanoscale Science Research Center for Nanophase Material Sciences (CNMS), Oak Ridge National Laboratory (ORNL), United States (2004-2008)
- Participation in Projects SPINHALL (2010-2013) and NMGEM (2011-2015) supported by French Agence Nationale de la Recherche, France
- Participation in Projects MACALO (2010-2013) and ConceptGraphene (2010-2013) supported by European Union
- Participation in Project EHDR Heads in the framework of Information Storage Industry Consortium (with Western Digital, Seagate) (2005-2008)

V. Scientific Expertise and Synergetic Activities:

- Jury member (reporter, examiner and president) for PhD and Habilitations Degree defenses (>10)
- Expertise of projects for Agence nationale de la recherche (ANR), for European Research Council (ERC Adv. Grants), for American Chemical Society (PRF)
- Referee for peer reviewed journals of American Physical Society, American Chemical Society, IEEE, AIP et Elsevier: (Phys. Rev. Lett., Appl. Phys. Lett., Phys. Rev. B, Nano Letters, Journ. of Magn. and Magn. Mat., Chem. Phys. Lett., IEEE Trans. Magn.)
- Member of Organizing Committee for «European Workshop on Epitaxial Graphene» (EWEG2013), Aussois, France (2013)
- Member of Program Committee for «International Conference on Magnetism» (INTERMAG 2012), Vancouver, Canada (2012)
- Member of Organizing Committee for Workshop «Modern Trends in Magnetism» dedicated to 80th anniversary of I. Dzyaloshinskii, Grenoble, France (2011)
- Member of Publication Committee of «International Conference on Magnetism (INTERMAG 2008)», Madrid, Espagne (2008)
- Editor for IEEE Transactions on Magnetism (Proceedings)
- Member of American Physical Society (APS) and Institute of Electrical and Electronics Engineers (IEEE)

VI. Teaching Experience:

Années	Cours	Lieu
2011-2012	Cours (lectures) à l'Ecole Doctorale de Physique "Nanomagnétisme et électronique de spin" (Master, 18h)	Université Joseph Fourier, Grenoble, France
2011-2012	UE PHY121 Mécanique du point matériel (undergraduate, 96h)	Université Joseph Fourier, Grenoble, France
2011-2012	UE PHY112 Physique générale: Lois de Conservation et Fluides (undergraduate, 114h)	Université Joseph Fourier, Grenoble, France
2009-2010	Cours (lectures) à l'Ecole Doctorale de Physique "Transport électronique et spintronique" (Master, 18h)	Université Joseph Fourier, Grenoble, France
2007-2008	Lectures on Spin Dependent Tunneling (Master, 16h)	University of Alabama, USA
2006-2007	Lectures on "Noise in Magnetic Recording" (Master, 8h)	University of Alabama, USA
2001-2002	Travaux dirigés d'Electromagnétisme, Thermodynamique (undergraduate, ATER 192h)	Université Louis Pasteur, Strasbourg, France
1993-1994	Travaux pratiques de physique en optique, mécanique et électricité (undergraduate, 72h)	Moscow Lomonosov State University, Russie
1999-2000	Cours privés «Mathematics and Mechanics» pour les élèves de la "British International School" (high school, 92h)	Moscou, Russie
1994-1997	Cours privés en physique et mathématiques (high school, 480h)	Moscou, Russie

VII. Supervising Activities:

- Advising for 2 PhD students, 3 postdocs, 2 Master students and of researcher at Spintec (France):
 - H.-X. Yang, PhD Fondation Nanosciences (2009-2012)
«First-principles study of spintronic phenomena in magnetic tunnel junctions and graphene»
 - P. Merodio, PhD MENESR (avec H. Bea et V. Baltz, 2011-2014)
«Action du transfert de spin sur les matériaux antiferromagnétiques»
 - C. Ortiz, stage M2 (ENS Lyon, 2011) et thèse KAUST (avec A. Manchon, 2011-2014)
«Spin transfer torques in magnetic insulator based tunnel junctions»
 - D. Terrade, stage M2 (UJF-Grenoble, 2010)
«Etude de la polarisation en spin induit dans le graphène par un couplage avec un isolant magnétique»
 - A. Kalitsov, post-doctorat Fondation Nanosciences (2009-2010)
Modélisation de phénomènes spintroniques
 - B. Belhadji, post-doctorat CNRS (2010-2012)
Calculs ab-initio de transport dans des jonctions tunnels magnétiques
 - Ali Hallal, post-doctorat CEA (2012-2013)
Calculs ab-initio de propriétés spintronique des structures à base de graphene
 - J. H. Lee, stage de recherche KIST (2008)
Ab initio calculations of electronic properties of magnetic tunnel junctions
- Co-advising for 4 PhD students, 2 research undergrads and visiting professor at University of Alabama, USA

VIII. Other skills:

Informatics:

- Fortran, Pascal, Basic, Maple, Mathematica, Mathcad, Multimédia (Internet), édition électronique, HTML, LaTeX, Microsoft Office
- Systèmes d'opérations: DOS, Windows, Unix, Linux

Languages:

- *French*: fluent
- *English*: fluent
- *Russian*: native language
- *Ossetian*: native language

IX. Research Interests

- Theory of spin dependent transport using analytical and numerical approaches (including free electrons, tight-binding, ab-initio and diffusive methods) in magnetic nanostructures:
 - Giant (GMR) and Tunnel (TMR) magnetoresistance
 - Spin transfer torques (STT) in spin valves and tunnel junctions with noncollinear magnetizations
 - Bloch state symmetry based spin filtering in insulator and semiconductor based crystalline magnetic tunnel junctions
 - Magnetocrystalline anisotropy
 - Interlayer exchange coupling (IEC)
 - Magnetic insulator based spin filtering
 - Anomalous (EHE) and Spin Hall (SHE) Effects
 - Resonant tunneling in double barrier magnetic tunnel junctions
- Electronic structure and magnetic properties of materials for spintronics:
 - chalcogenides and magnetic spinel oxides
 - Heusler alloys
 - rutiles and perovskites
 - graphene spintronics
 - ...
- Electron transport in atomic and molecular systems from the first principles

X. Publications/presentations:

- 48 papers (incl. Nature Physics, Phys. Rev. Lett., Appl. Phys. Lett.) + 3 chapters + 1 patent
- 2 invited lectures (2008 M-SNOWS, 2010 Collège Doctoral – Doktorandenkollegien “Quantum aspects of the Physics of low dimensional systems”)
- 12 invited talks:
 - 2012 Session Plénier du GDR Physique Quantique Mesoscopique, Aussois, France
 - 2011 AVS Annual International Symposium and Exhibition, Nashville, USA
 - 2011 Moscow International Symposium on Magnetism, Moscow, Russia
 - 2010 Gordon Research Conference, Bates College, Lewiston, ME, USA
 - 2010 Atelier GdR CoDFT, Lyon, France
 - 2010 International Symposium on Integrated Functionalities, San Juan, PR, Etats-Unis
 - 2010 Minatec Crossroads, Grenoble, France
 - 2009 APS March Meeting, Pittsburgh, PA, USA
 - 2009 Workshop "Les apports de la simulation numérique en nanosciences", France
 - 2008 Intermag Conference, Madrid, Spain
 - 2008 International School M-SNOW 2008, Nancy, France
 - 2008 Workshop “Materials for Spin Transfer Torque MRAM”, AL, USA
- >80 contributed presentations

B. LISTE DE PUBLICATIONS

M. Chshiev

Book Chapters:

"Introduction to spin-transfer torque", C. Baraduc, M. Chshiev, U. Ebels, in *Nanomagnetism and Spintronics - Fabrication, Materials, Characterization and Applications*, Eds: F. Nasirpour, A. Nogaret, World Scientific Publishing, Singapore, 2009, pp. 173-192

"Spin-Transfer Torques in Magnetic Tunnel Junctions", A. Manchon, N. Ryzhanova, M. Chshiev, A. Vedyayev, K.-J. Lee and B. Dieny, in *Giant Magnetoresistance: New Research*, Eds: A. D. Torres and D. A. Perez, Nova Science Publishers, New York, 2009, pp. 63-106

"Influence of interfaces on giant magnetoresistance in magnetic multilayers", A. Vedyayev, M. Chshiev, N. Tsidaeva and B. Dieny, in *Frontiers in Magnetism of Reduced Dimension Systems*, Eds: V. G. Bar'yakhtar, P. E. Wigen and N. A. Lesnik, Kluwer Academic Publishers (Dordrecht, Boston, London), 1998, p. 591

Patents:

"Techniques for characterizing the noise properties of tunnel junction film stacks with little or no processing", T. Mewes, M. Chshiev, C. Mewes, P. Leclair, W. H. Butler, U.S. Patent 60/954,604, 2008

Papers:

1. "Giant Spin Hall Effect Induced by Skew Scattering from Bismuth Impurities", Y. Niimi, Y. Kawanishi, D. H. Wei, C. Deranlot, H. X. Yang, M. Chshiev, T. Valet, A. Fert and Y. Otani, *Phys. Rev. Lett.* 109, 156602 (2012)
2. "Air-Protected Epitaxial Graphene/Ferromagnet Hybrids Prepared by Chemical Vapor Deposition and Intercalation", J. Coraux, A. T. N'Diaye, N. Rougemaille, Chi Vo-Van, A. Kimouche, H.-X. Yang, M. Chshiev, N. Bendiab, O. Fruchart, and A. K. Schmid, *J. Phys. Chem. Lett.* 3, 2059 (2012)
3. "Diffusive model of current-in-plane-tunneling in double magnetic tunnel junctions", P.-Y. Clement, C. Ducruet, C. Baraduc, M. Chshiev, and B. Diény, *Appl. Phys. Lett.* 100, 262404 (2012)
4. "Nonequilibrium coherent potential approximation for electron transport", A. Kalitsov, M. Chshiev and J. Velev, *Phys. Rev. B* 85, 235111 (2012)
5. "Room temperature magnetoresistance in CoFeB/SrTiO₃/CoFeB magnetic tunnel junctions deposited by ion beam sputtering", E. M. J. Hassen, B. Viala, M. C. Cyrille, M. Cartier, O. Redon, P. Lima, B. Belhadji, H. X. Yang, J. Velev, and M. Chshiev, *J. Appl. Phys.* 111, 07C727 (2012)
6. "Influence of Oxygen Monolayer at Fe/MgO Interface on Transport Properties in Fe/MgO/Fe(001) Magnetic Tunnel Junctions", P.-J. Zermatten, F. Bonell, S. Andrieu, M. Chshiev, C. Tiusan, A. Schuhl and G. Gaudin, *Appl. Phys. Express* 5, 023001 (2012)
7. "Inducing and optimizing magnetism in graphene nanomesh", H. X. Yang, M. Chshiev, D. W. Boukhvalov, X. Waintal and S. Roche, *Phys. Rev. B* 84, 214404 (2011)
8. "Charge trapping-detrapping mechanism of barrier breakdown in MgO magnetic tunnel junctions", S. Amara-Dababi, R. C. Sousa, M. Chshiev, H. Béa, J. Alvarez-Hérault, L. Lombard, I. L. Prejbeanu, K. Mackay, and B. Dieny, *Appl. Phys. Lett.* 99, 083501 (2011)

9. "Spin-polarized transport in structures with tunnel barriers", A. V. Vedyayev, O. A. Kotelnikova, L. Yu. Lystzeva, N. V. Ryzhanova, N. V. Strelkov and M. G. Chshiev, *Theor. Math. Phys.* 168, 1225 (2011)
10. "First-principles investigation of the very large perpendicular magnetic anisotropy at Fe|MgO and Co|MgO interfaces", H. X. Yang, J. H. Lee, M. Chshiev, A. Manchon, K. H. Shin, B. Dieny, *Phys. Rev. B* 84, 054401 (2011)
11. "Spin-current vortices in current-perpendicular-to-plane nanoconstricted spin valves", N. Strelkov, A. Vedyayev, N. Ryzhanova, D. Gusakova, L. D. Buda-Prejbeanu, M. Chshiev, S. Amara, N. de Mestier, C. Baraduc, B. Dieny, *Phys. Rev. B* 84, 024416 (2011)
12. "Ultrathin epitaxial cobalt films on graphene for spintronic investigations and applications", Chi Vo-Van, Z. Kassir-Bodon, H.X. Yang, J. Coraux, J. Vogel, S. Pizzini, P. Bayle-Guillemaud, M. Chshiev, L. Ranno, V. Santonacci, P. David, V. Salvador and O. Fruchart, *New J. Phys.* 12, 103040 (2010)
13. "Current-induced switching and magnetoresistance of noncollinear bulk magnetic structures", A. Kalitsov, M. Chshiev, B. Canals and C. Lacroix, *Phys. Rev. B* 82, 094420 (2010)
14. "Finite Element Modeling of Charge and Spin-currents in Magnetoresistive Pillars with Current Crowding Effects", N. Strelkov, A. Vedyayev, D. Gusakova, L. D. Buda-Prejbeanu, M. Chshiev, S. Amara, A. Vaysset, B. Dieny, *IEEE Magnetics Letters*, 1, 3000304 (2010)
15. "Effect of structural relaxation and oxidation conditions on interlayer exchange coupling in Fe|MgO|Fe tunnel junctions", H. X. Yang, M. Chshiev, A. Kalitsov, A. Schuhl and W. H. Butler, *Appl. Phys. Lett.* 96, 262509 (2010)
16. "Oscillatory interlayer exchange coupling in MgO tunnel junctions with perpendicular magnetic anisotropy", L. E. Nistor, B. Rodmacq, S. Auffret, A. Schuhl, M. Chshiev and B. Dieny, *Phys. Rev. B* 81, 220407 (2010)
17. "Perpendicular anisotropy of ultrathin epitaxial cobalt films on graphene", Chi Vo-Van, Z. Kassir-Bodon, H.X. Yang, J. Coraux, J. Vogel, S. Pizzini, P. Bayle-Guillemaud, M. Chshiev, L. Ranno, V. Santonacci, P. David, V. Salvador and O. Fruchart, *New J. Phys.* 12, 103040 (2010)
18. "A two-band model of spin-polarized transport in Fe/Cr/MgO/Fe magnetic tunnel junctions", A. Vedyayev, N. Ryzhanova, N. Strelkov, M. Chshiev and B. Dieny, *J. Appl. Phys.* 107, 09C720 (2010)
19. "Bias-voltage dependence of perpendicular spin-transfer torque in asymmetric MgO-based magnetic tunnel junctions", S.-C. Oh, S.-Y. Park, A. Manchon, M. Chshiev, J.-H. Han, H.-W. Lee, J.-E. Lee, K.-T. Nam, Y. Jo, Y.-C. Kong, B. Dieny & K.-J. Lee, *Nature Physics* 5, 898 (2009); advance online publication, 25 October 2009 | doi:10.1038/nphys1427
20. "Stable hydroxyl network on diamond (001) via first-principles and MD investigation", H. X. Yang, L. F. Xu, C. Z. Gu, Z. Fang, S. B. Zhang, M. Chshiev, *Surf. Sci.* 603, 3035 (2009)
21. "Calculated electronic and magnetic structure of rutile phase $V_{1-x}Cr_xO_2$ ", M. E. Williams, W. H. Butler, C. K. Mewes, H. Sims, M. Chshiev, and S. K. Sarker, *J. Appl. Phys.* 105, 07E510 (2009)
22. "Origin of low Gilbert damping in half metals", C. Liu, C. K. A. Mewes, M. Chshiev, T. Mewes, and W. H. Butler, *Appl. Phys. Lett.* 95, 022509 (2009)
23. "Spin-transfer torque in magnetic tunnel junctions", A. Kalitsov, M. Chshiev, I. Theodonis, N. Kioussis, and W. H. Butler, *Phys. Rev. B* 79, 174416 (2009)
24. "Induced half-metallicity in Cr-based ferromagnetic chalcospinel with anion substitutions: $CuCr_2S(Se)_{4-x}E_x$ ($E=F, Cl, Br$), $Cu(Cd)Cr_2S(Se)_{4-x}$ and $CdCr_2S(Se)_{4-x}D_x$ ($D=N, P, As$)", Y.-H.W. Wang, A. Gupta, M. Chshiev, W. H. Butler, *Appl. Phys. Lett.*, 94, 062515 (2009)
25. "High magnetization FeCo|Pd multilayers", M.J. Walock, H. Ambaye; M. Chshiev, F.R. Klose, W.H. Butler, G.J. Mankey, *J. of Vacuum Sci and Tech A*, 26, 731 (2008)
26. "Voltage Dependence of Spin Transfer Torque in Magnetic Tunnel Junctions", M. Chshiev, I. Theodonis, A. Kalitsov, N. Kioussis, and W. H. Butler, *IEEE Trans. Magn.* 44, 2543 (2008)

27. "Description of current-driven torques in magnetic tunnel junctions", A. Manchon, N. Ryzhanova, A. Vedyayev, M. Chshiev and B. Dieny, *J. Phys.: Cond. Matter*, 20, 145208 (2008)
28. "Half-Metallic Electronic Structures of Quaternary Ferromagnetic chalcospinels: $\text{Cd}_x\text{Cu}_{1-x}\text{Cr}_2\text{S}_4$ and $\text{Cd}_x\text{Cu}_{1-x}\text{Cr}_2\text{Se}_4$ ", Y.-H. W. Wang, A. Gupta, M. Chshiev, W. H. Butler, *Appl. Phys. Lett.*, 92, 062507 (2008)
29. "Half-Metallic L_{21} Structures with (001) Planar Insertions", C. Culbert, M. Williams, M. Chshiev, W. H. Butler, *Journ. of Appl. Phys.* 103 (2008) 07D707
30. "Ab-initio Studies of Magnetic Properties of CoFePd Alloys and Multilayers", M. Chshiev and W. H. Butler, *IEEE Trans. Magn.* 43 (2007) 2199
31. "Magnetism, and Transport of CuCr_2Se_4 Thin Films", J. S. Bettinger, R.V. Chopdekar, M. Liberati, J.R. Neulinger, M. Chshiev, Y. Takamura, L.M.B. Alldredge, E. Arenholz, Y.U. Idzerda, A.M. Stacy, W.H. Butler, Y. Suzuki, *J. of Magn. and Magn. Mater.*, 318 (2007) 65
32. "Anomalous Bias Dependence of Spin Torque in Magnetic Tunnel Junctions", I. Theodonis, A. Kalitsov, N. Kioussis, M.Chshiev, and W. H. Butler, *Phys. Rev. Lett.* 97 (2006) 237205
33. "Spin Dependent Tunneling in FM|semiconductor|FM structures", S. Vutukuri, M. Chshiev, W. H. Butler, *Journ. of Appl. Phys.* 99 (2006) 08K302
34. "Spin-Polarized Current Induced Torque in Magnetic Tunnel Junctions", A. Kalitsov, I. Theodonis, N. Kioussis, M. Chshiev, W. H. Butler, A. Vedyayev, *Journ. of Appl. Phys.* 99 (2006) 08G501
35. "Theory of Tunneling Magnetoresistance for Epitaxial Systems", W. H. Butler, X.-G. Zhang, S. Vutukuri, M. Chshiev, and T. C. Schulthess, *IEEE Trans. Magn.* 41 (2005) 2645
36. "Role of heating and current-induced forces in the stability of atomic wires", Z. Yang, M. Chshiev, M. Zwolak, Y.-C. Chen, M. Di Ventra, *Phys. Rev. B* 71 (2005) 041402
37. "Impurity-induced tuning of quantum well states in spin-dependent resonant tunneling", A. Kalitsov, A. Coho, N. Kioussis, A. Vedyayev, M. Chshiev and A. Granovsky, *Phys. Rev. Lett.* 93 (2004) 046603
38. "Influence of quantum well states on transport properties of double barrier junctions", M. Chshiev, D. Stoeffler, A. Vedyayev and K. Ounadjela, *Journ. of Magn. and Magn. Mater.*, 240 (2002) 146
39. "Quantum coherent transport versus diode-like effect in semiconductor free metal/insulator structure", C. Tiusan, M. Chshiev, A. Iovan, V. da Costa, D. Stoeffler, T. Dimopoulos and K. Ounadjela, *Appl. Phys. Lett.* 79 (2001) 4231
40. "Magnetic Diode Effect in Double Barrier Junctions", M. Chshiev, D. Stoeffler, A. Vedyayev and K. Ounadjela, M. Chshiev, D. Stoeffler, A. Vedyayev and K. Ounadjela, *Europhys. Lett.* 58 (2002) 257
41. "Magnetoresistance of Magnetic Tunnel Junctions in the presence of a nonmagnetic layer", A. Vedyayev, M. Chshiev, B. Dieny, N. Ryzhanova, *Phys. Rev. B*, 61 (2000) 1366
42. "Angular dependence of CPP transport in magnetic sandwiches", A. Vedyayev, O. Kotelnikova, N. Pugach, M. Chshiev, *Fizika Tverdogo Tela (Russian)*, 41 (1999) 1814, *Physics of the Solid State*, 41 (1999) 1665
43. "Quantum effects in giant magnetoresistance due to interfaces in magnetic sandwiches", A. Vedyayev, M. Chshiev, B. Dieny, *Journ. of Magn. and Magn. Mater.*, 184 (1998) 145
44. "A unified theory of giant magnetoresistance in magnetic sandwiches", A. Vedyayev, M. Chshiev, N. Ryzhanova et al, *Journ. of Magn. and Magn. Mater.*, 172 (1997) 53
45. "Extraordinary Nernst-Ettingshausen effect in magnetic granular alloys", A. Kalitsov, M. Chshiev, N. Tsidaeva, *Vestnik MGU, Fizika i Astronomia (Russian)*, 33 (4) (1997)
46. "Extraordinary Hall effect in magnetic granular alloys", A. Granovsky, F. Brouers, A. Kalitsov, M. Chshiev, *Journ. of Magn. and Magn. Mater.*, 166 (1997) 193

47. **"Quantum statistical theory of giant magnetoresistance in magnetic heterogeneous alloys"**, A. Vedyayev, B. Mevel, N. Ryzhanova, M. Tshiev, B. Dieny, A. Chamberaux, F. Brouers, *Journ. of Magn. and Magn. Mater.*, 164 (1996) 91
48. **"Quantum statistical calculation of spontaneous anisotropy of giant magnetoresistance in spin-valve sandwiches"**, A. B. Granovsky, A. V. Vedyayev, B. Dieny, A. V. Kalitsov, M. G. Chshiev, *Fizika Tverdogo Tela (Russian) (Solid State Physics)*, vol.38 N 8 (1995), 2471-2477

Presentations:

Invited talks and lectures:

1. **"Theoretical aspects of spintronic phenomena in magnetic tunnel junctions and graphene based structures"**, Session Plénier du Groupement de Recherche (GDR) "Physique Quantique Mesoscopique", Centre Paul Langevin, Aussois, France, October 15-18, 2012
2. **"Spin Transport Phenomena in Nanostructures with Non-Collinear Magnetic Moments"**, AVS 58th Annual International Symposium and Exhibition, Nashville, TN, USA, October 30 - November 4, 2011
3. **"Mechanisms of Perpendicular Magnetic Anisotropy at Co(Fe)/MgO Interfaces"**, Moscow International Symposium on Magnetism, Moscow, Russia, August 21-25, 2011
4. **"Theory of spintronic phenomena in magnetic tunnel junctions"**, 2010 Topical School "Quantum aspects of Physics of low dimensional systems", College doctoral-Doktorandenkollegien, Nancy, France, November 23-25, 2010
5. **"Spin transport in noncollinear magnetic configurations by first-principles and tight-binding approaches"**, Atelier du Groupement de Recherche (GDR) Co-DFT "Théorie et modélisation pour le magnétisme: de la molécule au transport polarisé en spin", Centre Blaise Pascal ENS Lyon, Gerland, Lyon, November 3-5, 2010
6. **"Spin transfer torques in magnetic tunnel junctions"**, Gordon Research Conferences "Magnetic nanostructures", Bates College, Lewiston, ME, USA, August 8-13, 2010
7. **"Non-collinear spin transport in layered structures and bulk materials for spintronics"**, MINATEC Crossroads'10, Grenoble, France, June 23-24, 2010
8. **"Quantum theory of spin transfer torques in a view of memory applications"**, International Symposium on Integrated Functionalities (ISIF 2010) San Juan, PR, USA, June 13-16, 2010
9. **"Description of spintronic phenomena with tight-binding and ab-initio simulation tools"**, Workshop de la Fondation Nanosciences "Les apports de la simulation numérique en nanosciences", Grenoble, France, March 23, 2009
10. **Voltage dependence properties of ballistic spin currents and spin transfer torques in magnetic tunnel junctions**, M. Chshiev, 2009 APS March Meeting, Pittsburgh, PA, March 16-20, X29.0006 (invited)
11. **"Voltage dependence of spin transfer torques in magnetic tunnel junctions"**, Workshop "Materials for Spin Transfer Torque MRAM", Tuscaloosa, AL, October 15, 2008
12. **"Modelling Spintronic Phenomena"**, MINATEC Crossroads'08 M4NANO, Grenoble, France, June 24, 2008
13. **"Design of New Spintronic Materials"**, International School M-SNOW 2008, Nancy, France
14. **"Nature of voltage dependence of spin transfer torque in magnetic tunnel junctions"**, 2008 Intermag Conference, Madrid, Spain, May 4-8, CC-02

Invited seminars:

1. **"Recent Trends in Understanding of Spintronic Phenomena in Magnetic Tunnel Junctions and Graphene-Based Structures"**, University of California, San Diego, CA, USA, and University of Alabama, August 14 and 17, 2012
2. **"Spin Transport Phenomena in Nanostructures with Non-Collinear Magnetic Moments"**, CNRS/Thales, Palaiseau (France), June 20, 2011
3. **"First-principles studies of perpendicular magnetic anisotropy and interlayer exchange coupling in MgO-based tunnel junctions"**, CNRS/Thales, Palaiseau (France), May 12, 2011
4. **"Spintronic phenomena in nanostructures with noncollinear magnetic moments using first principles and tight-binding approaches"**, King Abdullah University of Science and Technology, Thuwal, Saudi Arabia, December 1, 2010
5. **"Recent advances in theory of spintronic phenomena"**, seminaire de la Fondation Nanosciences, Grenoble, France, February 26, 2009
6. **"Spin dependent transport properties and electronic structure of materials for spintronics"**, University of Maryland Eastern Shore, Princess Anne, MD, USA, October 30, 2007
7. **"Spin torque in magnetic tunnel junctions and electronic structure of materials for spintronics"**, CNRS/Thales, Palaiseau (France), June 13, 2007
8. **"Spin torque in magnetic tunnel junctions and electronic structure of materials for spintronics"**, IPCMS/GEMME, Strasbourg (France), July 27, 2007
9. **"Spin-dependent transport in structures with giant and tunnel magnetoresistance"**, California State University, Northridge, CA, USA, January 2005
10. **"Transport polarise en spin dans une jonction tunnel a double barriere"**, Laboratoire Louis Neel, Avril, 2002
11. **"Spin-polarized transport in double barrier junctions assisted by quantum well states"**, M. Chshiev, Thales CSF-Universite Paris-Sud, January, 2001

Contributed talks and posters:

1. **"Characterization of double barrier magnetic tunnel junction by current-in-plane tunnelling"**, 12th Joint MMM/Intermag Conference, Chicago, IL, January 14-18, 2013
2. **"Non-equilibrium coherent potential approximation for electron transport"**, A. Kalitsov, M. Chshiev, J. Velez, 2012 APS March Meeting, February 27 - March 2, 2012; Boston, MA, USA; Y15.00007
3. **"Ab-initio justification of correlation between perpendicular magnetic anisotropy and Bloch states spin filtering in MgO-based tunnel junctions"**, H. X. Yang, M. Chshiev, B. Dieny, 56th Conference on Magnetism and Magnetic Materials, October 30 - November 3, 2011, Scottsdale, AZ, USA; CC-05
4. **"First-principle studies of Interlayer Exchange Coupling in Co/SrTiO₃/Co Magnetic Tunnel Junctions"**, H. X. Yang, B. Belhadji, J. Velez, M. Chshiev, 56th Conference on Magnetism and Magnetic Materials, October 30 - November 3, 2011, Scottsdale, AZ, USA; FP-11
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12. **"Effect of occupation numbers on exchange coupling in low dimensional magnetic nanostructures"**, D. Terrade, H. X. Yang, A. Kalitsov, L. Nistor, M. Chshiev, B. Dieny, 2011 APS March Meeting, March 21-25, 2011; Dallas, TX, USA; BAPS.2011.MAR.B19.12
13. **"Influence of oxidation conditions on indirect coupling in perpendicular magnetic tunnel junctions"**, L.E. Nistor, B. Rodmacq, S. Auffret, M. Marins de Castro Souza, M. Chshiev, A. Schuhl and B. Dieny, 55th Conference on Magnetism and Magnetic Materials, November 14-18, 2010, Atlanta, GA, USA; HB-08
14. **"Bias-voltage Dependence of Perpendicular Spin-Transfer Torque in Asymmetric MgO-based Magnetic Tunnel Junctions"** (invited), S. Oh, S. Park, A. Manchon, M. Chshiev, J. Han, H. Lee, J. Lee, K. Nam, Y. Jo, Y. Kong, B. Dieny, K. Lee, 55th Conference on Magnetism and Magnetic Materials, November 14-18, 2010, Atlanta, GA, USA; GC-01
15. **"Perpendicular magnetic anisotropy of ultrathin epitaxial cobalt films on graphene"**, C. Vo-Van; Z. Kassir-Bodon; H. Yang; C. Johann; J. Vogel; S. Pizzini; P. Bayle-Guillemaud; M. Chshiev; L. Ranno; V. Santonacci; P. David; V. Salvador; O. Fruchart, 55th Conference on Magnetism and Magnetic Materials, November 14-18, 2010, Atlanta, GA, USA; CE-05
16. **"Oscillatory interlayer exchange coupling in Fe|GaAs|Fe and Fe|ZnSe|Fe tunnel junctions from first-principles calculations"**, H. Yang, M. Chshiev, A. Kalitsov, A. Schuhl, B. Dieny, 55th Conference on Magnetism and Magnetic Materials, November 14-18, 2010, Atlanta, GA, USA; CB-09
17. **"Effect of occupation numbers on Interlayer Exchange Coupling"**, D. Terrade, A. Kalitsov, H. Yang; M. Chshiev, X. Waintal, C. Baraduc, B. Dieny, 55th Conference on Magnetism and Magnetic Materials, November 14-18, 2010, Atlanta, GA, USA; CB-08
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21. **"Couplage indirect oscillant dans des jonctions tunnel à anisotropie perpendiculaire"**, L.E. Nistor, B. Rodmacq, S. Auffret, A. Schuhl, M. Chshiev and B. Dieny, Colloque Louis Néel, Albé (France), March 30-April 02, 2010, O-ES2-2

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23. **"Mechanism of magnetotransport properties modulation via interfacial electronic structure in single crystal Fe-MgO-Fe tunnel junctions"**, Tiusan, C., H. Yang, M. Chshiev, F. Greullet, C. Bellouard, Y. Lu, F. Montaigne and M. Hehn, Colloque Louis Néel, Albé (France), March 30-April 02, 2010, P-ES-33
24. **"Effect of oxidation conditions on interlayer exchange coupling in Fe/MgO/Fe MTJs from first-principles and tight-binding approaches"**, Yang, H., M. Chshiev, A. Kalitsov, A. Schuhl and W.H. Butler, Colloque Louis Néel, Albé (France), March 30-April 02, 2010, P-TMM-24
25. **"Modélisation des courants de charge et de spin dans des dispositifs de géométrie complexe"**, D. Gusakova, N. Strelkov, A. Vedyayev, N. Ryzhanova, L.D. Buda-Prejbeanu, M. Chshiev, S. Amara, A. Vaysset, C. Baraduc and B. Dieny, Colloque Louis Néel, Albé (France), March 30-April 02, 2010, O-TMM-1
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31. **"Spin polarized transport in Fe|Cr|(Fe)|MgO|Fe magnetic tunnel junctions using a two-band model"**, A. Vedyayev, N. Ryzhanova, N. Strelkov, M. Chshiev and B. Dieny, 11th Joint MMM/Intermag Conference, Washington, DC, Jan. 18-22, 2010, FB-07
32. **"Effect of oxidation conditions on interlayer exchange coupling in Fe|MgO|Fe tunnel junctions from first-principles and tightbinding approaches"**, H. Yang, M. Chshiev, A. Kalitsov, A. Schuhl and W.H. Butler, 11th Joint MMM/Intermag Conference, Washington, DC, Jan. 18-22, 2010, FB-08
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36. **"Rational design of half-metallic alloys"**, W. H. Butler, C. Mewes, C. Liu, M. Chshiev, 2009 APS March Meeting, Pittsburgh, PA, March 16-20, H32.0006
37. **"Calculation of intrinsic damping in half metals"**, C. Liu, C. Mewes, M. Chshiev, T. Mewes, W. H. Butler, 2009 APS March Meeting, Pittsburgh, PA, March 16-20, T32.0005

38. **"Analytical properties of ballistic spin currents and torques in magnetic tunnel junctions"**, M. Chshiev, A. Kalitsov, A. Manchon, A. Vedyayev, W. H. Butler, Magnetic Single Nano-Object Workshop and School (M-SNOWS 2008), Nancy, France, November 23-28, P4
39. **Nonequilibrium properties of spin transfer torque and tunnel magnetoresistance in magnetic tunnel junctions**, M. Chshiev; A. Kalitsov, I. Theodonis; N. Kioussis, W. H. Butler, 53rd MMM Conference, Austin, TX, Nov. 10-14, EB-01
40. **Calculated Electronic and Magnetic Structure of Rutile Phase $V_{1-x}Cr_xO_2$** , M.E. Williams, W. H. Butler, C. Mewes, H. Sims and M. Chshiev, 53rd MMM Conference, Austin, TX, Nov. 10-14, BE-08
41. **Induced half-metallic state in Cr-based: $CuCr_2S(Se)_{4-x}E_x$ ($E=F, Cl, Br$), $Cu(Cd)Cr_2S(Se)_{4-x}$ and $CdCr_2S(Se)_{4-x}D_x$ ($D=N, P, As$)**, Y.-H. W. Wang, A. Gupta, M. Chshiev, W. H. Butler, 53rd MMM Conference, Austin, TX, Nov. 10-14, FD-01
42. **Calculation of intrinsic damping in half metals**, C. Liu, C. Mewes, M. Chshiev, T. Mewes, W. H. Butler, 53rd MMM Conference, Austin, TX, Nov. 10-14, GF-04
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47. **Half-Metallic $L2_1$ Heusler Alloys with (001) Planar Insertions**, C. A. Culbert, M. E. Williams, M. Chshiev and W. H. Butler, 52nd MMM Conference, Tampa, FL, Nov. 5-9, DB-03
48. **Induced half-metallic state in quaternary chalcospinels of $Cd_xCu_{1-x}Cr_2S(Se)_4$** , Y.-H. W. Wang, A. Gupta, M. Chshiev, W. H. Butler, 52nd MMM Conference, Tampa, FL, Nov. 5-9, DB-12
49. **Spin torque in magnetic tunnel junctions and electronic structure of materials for spintronics**, seminaire CNRS/Thales, June 13, 2007
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