
CURRICULUM VITAE

Sébastien Merkel
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Professor

Unité Matériaux et Transformations

Université Lille 1 – Institut Universitaire de France

Born on September 11th, 1974 in
Ambilly, Haute-Savoie, France
Citizenship: French

RESEARCH STATEMENT

My research focuses on understanding the dynamics and formation of the deeper portions of the Earth. I perform experiments under the pressure and temperature of the Earth's interior to study microstructures in polycrystals, their mechanical behaviour, and their relation to phase transformations. I then integrate the results of my experiments into polycrystal numerical models to understand wave propagation through complex microstructures and compare the results of these models to seismic observations. This work aims at understanding the dynamics and formation of the Earth's mantle and inner core.

PROFESSIONAL EXPERIENCE

2010–present: Professor of Physics at the Université Lille 1, France

2014–present: Junior member of the Institut Universitaire de France

2006–2010: CNRS research assistant at the Université Lille 1, France

2004–2006: Miller fellow at the Department of Earth and Planetary Science, University of California, Berkeley, USA, with Hans-Rudolf Wenk

2002–2004: Japanese Society for the Promotion of Science (JSPS) post-doctoral fellow at the Institute for Solid State Physics, University of Tokyo, Japan, with Takehiko Yagi

1999–2002: PhD student at the Laboratoire des Sciences de la Terre of the Ecole Normale Supérieure de Lyon, France, and the Geophysical Laboratory, Carnegie Institution of Washington, USA. Supervision: Philippe Gillet and Russell J. Hemley

1997–1999: predoctoral fellow at the Geophysical Laboratory, Carnegie Institution of Washington, Washington DC, USA, with Russell J. Hemley

EDUCATION

2009: “Habilitation à diriger les recherches” in Physics at the Université Lille 1, France

1999–2002: PhD in Geology at the Ecole Normale Supérieure de Lyon, France

1997: MSc in Physics at the Ecole Normale Supérieure de Lyon, France

1994–1996: Undergraduate studies in Physics at the Ecole Normale Supérieure de Lyon, France

1992–1994: “Classes préparatoires” at the Lycée du Parc, Lyon, France

1992: Baccalauréat, série C, Lycée International de Ferney Voltaire, France

DISTINCTIONS

2014: Selected as Junior Member of the Institut Universitaire de France

2011: Medal for Research Excellence of the European Mineralogical Union

2002: Mineral and Rock Physics Outstanding Student Award, American Geophysical Union

SCIENTIFIC PRODUCTION

Publications

- 52 publications in peer-reviewed international journals including
 - 25 in geophysics and mineralogy (*Phys Earth Planet Inter*, *Geophys Res Lett*, *J Geophys Res*, *Earth Planet Sc Lett*, etc)
 - 15 in physics and materials science (*Phys Rev B*, *Acta Mat*, etc)
 - 8 on experimental developments (*J Appl Cryst*, *Rev Sci Instrum*, etc)
 - 4 in general audience journals (*Science*)
- 11 other publications (editorials, book chapters, thesis, etc)
- Citations statistics (Source: [ResearcherID](#), February 2016) : 56 records, 1211 citations, h-index: 20

Communications

- 19 invited presentations in international conferences, 3 in French conferences
- 15 seminars
- 45 other presentations given in person

SUPERVISION

Post-doctoral fellows

- 2013-2014: Angelika Rosa, fellowship of the Swiss National Fund

PhD student

- 2014–now: Christopher Langrand, Université Lille 1, co-supervised with Nadège Hilairret.
- 2010–2013: Ainoha Lincot, Université Joseph Fourier, Grenoble, co-supervised with Ph. Cardin
Direct models of Earth inner core seismic anisotropy and study of textures induced by the α - ϵ transition in Fe
- 2009–2013: Caroline Bollinger, Université Lille 1
Rheology of polycrystalline olivine under upper mantle conditions: an in-situ study in the D-DIA
- 2008–2011: Carole Nisr, Université Lille 1, co-supervised with P. Cordier
In-situ characterization of dislocations in minerals under high pressure

Master and other students supervised

- 2015: Agnes Valovics, University of St Andrews, Scotland, Undergraduate research project
- 2015: David Fuseau, Université Lille 1, Undergraduate research project
- 2014: Ali Dia, Université Lille 1, Master Thesis
- 2014: Benjamin Malfait, Guillaume Bonamis, Université Lille 1, Undergraduate research project
- 2013: Loraine Boust, Lycée Malherbe, Caen, Undergraduate research project
- 2012: Amélie Malpot, Ecole Centrale de Lille, Master Thesis
- 2012: Maxime Thiebaut, Rémi Fourier, Université Lille 1, Undergraduate research project
- 2011: Florian Marmuse, Lycée Louis-le-grand, Paris, Undergraduate research project
- 2008: Marion Gruson, Ecole Centrale de Nantes, Master Thesis
- 2007: Carole Nisr, Université Lille 1, Master Thesis
- 2005: Lowell Miyagi, University of California, Berkeley, un-official supervision of the 1st year of PhD thesis, official advisor: Hans-Rudolf Wenk
- 2003: Tristan Ferroir, Ecole Normale Supérieure de Lyon, Undergraduate internship

PROFESSIONAL INVOLVEMENT

Local, University Lille 1

- 2011–now: Member of the Physics Teaching Department Council
- 2010–now: Webmaster of the Master of Physics at Université Lille 1 (<http://master-physique.univ-lille1.fr/>)
- 2008–now: Webmaster for the UMET laboratory (<http://umet.univ-lille1.fr>)
- 2013: Restructuring of the curriculum in condensed matter physics
- 2008–2014: Member of the Laboratory Council
- 2007–2010: Member of the Physics Department Recruitment Council

National

- 2011: Co-organiser of the *Plasticité 2011* workshop in Lille
- 2009, 2011: Co-organizer of prospective meeting on synchrotron in Earth science (Lyon and Paris)
- 2009: report on the use of synchrotron in Earth science in France for the Société Française de Minéralogie et Cristallographie

International

- 2015–now: representative for *Dynamics and Extreme Conditions* at the ESRF Users Organisation Committee
- 2015–now: chair for the *Mineral and Rock Physics Early Career Award* at the American Geophysical Union
- 2012–now: member of the executive committee for *Mineral and Rock Physics* at the American Geophysical Union
- 2012–2014: Program officer for *Mineral and Rock Physics* at the American Geophysical Union Fall Meeting (22000 abstracts in 2013, including 450 for MRP)
- Session organizer for the *American Geophysical Union Fall meeting* (2007, 2010, 2011, 2013, 2014, 2015), the *European Mineralogical Conference* (2014) and the *European Geoscience Union General Assembly* (2016). Organization of the ESRF User Meeting (2016)

REVIEWER CONTRIBUTIONS

Dissertation committees

- 2016: PhD Thesis, Arnaud Proietti, Université de Toulouse, France
- 2015: Habilitation à Diriger les Recherches, Agnès Dewaële, Université Pierre et Marie Curie, Paris, France
- 2012: PhD Thesis, Angelika Rosa, ETH Zurich, Switzerland
- 2011: PhD Thesis: Giacomo Lo Nigro Université Blaise Pascal-Clermont-Ferrand II, France

Scientific journals

- About 75 reviews for scientific journals: 50 % in geophysics and mineralogy, 25 % in physics et materials science, 5 % on experimental developments and 15 % in general audience journals (*Science*, *Nature*)

Funding bodies

- Reviewer for the National Science Foundation
- Reviewer and panel member for the Deutsche Forschungsgemeinschaft
- Reviewer for the Agence Nationale de la Recherche
- Panel member for some IDEX fundings
- Reviewer for the Programme National de Planétologie at INSU, CNRS

RECENT FUNDING

- Recurrent beamtime on international large scale facilities (synchrotrons, free electron lasers, etc): 109 shifts for the group in 2015 (shared with N. Hilairat, P. Raterron, and collaborators)
- 2014–2019: Junior member of the Institut Universitaire de France, 75 k€
- 2014: “Etude in-situ des mécanismes de transition dans le système olivine-wadsleyite-ringwoodite-perovskite”, Programme National de Planétologie, CNRS, 8 k€
- 2013: “Etude in-situ des mécanismes de transition dans le système olivine-wadsleyite-ringwoodite-perovskite”, Programme National de Planétologie, CNRS, ~12 k€
- 2008–2011: Principal Investigator of the “Dislocations under Pressure”, ANR Jeunes Chercheurs grant n. ANR-07-5CJC-0136-01, 200 k€
- 2009–2013: participation to the “Mantle Rheology” project of P. Raterron, Université Lille 1, ANR program grant n. BLAN08-2_343541, 368 k€
- 2009–2012: participation to the “Deformation and transformation of hydrous minerals in subduction zones” project of B. Reynard, ENS Lyon, ANR Program grant n. ANR-08-BLAN-0192, 300 k€
- 2007: Principal Investigator for “Plasticité des phases post-perovskites”, French national program SEDIT, 23 k€.
- 2006: Starting grant (BQR) of the Université Lille 1, 50 k€.

TEACHING

Undergraduate courses

- Physics for geologists (24h, 2nd year in geology, course, practicals)
- Physics of the Earth (20h, 3rd year in physics, course)
- Endogenous petrology (8h, 3rd year in geology, course, practicals)

Master classes

- Advanced materials characterization (14h, 2nd year, course, practicals)
- Physics of deformation (10h, 2nd year, course)
- Scientific publishing (8h, 2nd year, course, practicals)

Taught in the past

- Introduction to materials science (master, 1st year, course)
- Scientific computing (master 1st year, course)
- Physics applied to natural sciences (undergraduate, 1st year, course, practicals, labs)
- Newtonian mechanics (undergraduate, 1st year, course)
- Wave and vibrations (undergraduate, 2nd year, practicals, labs)
- Continuum mechanics (undergraduate, 2nd year, labs)
- Information technology (undergraduate, 1st year, practicals)
- Physics for physicians (undergraduate, 1st year, practicals)

Graduate courses and summer schools

- Workshop on *Texture Analysis Using the Rietveld Method from Synchrotron X-ray Diffraction Data*, HPSTAR, Shanghai, China, 19-20 May, 2015
- *Méthodes d'analyse des minéraux et matériaux*, Société Française de Minéralogie et Cristallographie, Paris, France, 20-21 October 2014
- *Ecole Prédoctorale sur la Terre Interne*, École de Physique des Houches, France, 6-17 Octobre 2014
- *Ecole doctorale observatoire de Strasbourg*, France, March 2011
- *International School of Crystallography*, Erice, Sicile, Italy, 4-14 June 2009
- *Structure et dynamique du manteau profond*, École de Physique des Houches, France, 12-17 October 2008
- *Textures and Microstructures in the Earth Sciences*, DFH-UFA Summer School, Freiberg, Germany, July 2005

SEMINARS AND COMMUNICATIONS

SEMINARS: 15

1. Laboratoire de Géologie, Ecole Normale Supérieure, Paris, France, Novembre 2015
2. Center for High Pressure Science & Technology Advanced Research, Shanghai, China, May 2015
3. Earth, Environmental and Planetary Sciences, Brown University, Providence, RI, USA, April 2015
4. Institut für Mineralogie, Universität Münster, Germany, October 2014
5. Géosciences Montpellier, France, January 2013
6. Bayerisches Geoinstitut, University of Bayreuth, Bayreuth, Germany, May 2012
7. Inst. für Geochemie und Petrologie, ETH Zürich, Switzerland, March 2010
8. Laboratoire de Géophysique Interne et de Tectonophysique, Grenoble, France, October 2009
9. Geodynamic Research Center, Ehime University, Matsuyama, Japan, January 2009
10. Laboratoire Magmas et Volcans, Université Blaise Pascal de Clermont-Ferrand, France, January 2008
11. Laboratoire de Structures et Propriétés de l'Etat Solide, Université des Sciences et Technologies de Lille, France, February 2007
12. Laboratoire de Géologie de l'Ecole normale supérieure, Paris, France, November 2006
13. Berkeley Seismological Laboratory, University of California, Berkeley, USA, November 2004
14. Laboratoire de Structures et Propriétés de l'Etat Solide, Université des Sciences et Technologies de Lille, France, December 2003
15. Laboratoire des Sciences de la Terre, Ecole Normale Supérieure de Lyon, France, 2002

TEACHING IN SUMMER SCHOOLS AND EQUIVALENT: 7

1. Workshop on *Texture Analysis Using the Rietveld Method from Synchrotron X-ray Diffraction Data*, HPSTAR, Shanghai, China, 19-20 May, 2015
2. *Méthodes d'analyse des minéraux et matériaux*, Société Française de Minéralogie et Cristallographie, Paris, France, 20-21 October 2014
3. *Ecole Prédoctorale sur la Terre Interne*, École de Physique des Houches, France, 6-17 Octobre 2014
4. *Ecole doctorale observatoire de Strasbourg*, France, March 2011
5. *International School of Crystallography*, Erice, Sicile, Italy, 4-14 June 2009
6. *Structure et dynamique du manteau profond*, École de Physique des Houches, France, 12-17 October 2008
7. *Textures and Microstructures in the Earth Sciences*, DFH-UFA Summer School, Freiberg, Germany, July 2005

INVITED PRESENTATIONS IN INTERNATIONAL CONFERENCES: 19

1. S. Merkel, Anisotropy, textures, and slip systems in post-perovskite: experimental approach, ppv@10: a meeting for the 10th anniversary of the discovery of post-perovskite, Bristol, United-Kingdom, June 2014
2. S. Merkel, Extracting of single crystal properties from measurements on polycrystals, Elastic Properties of Iron in Extreme Conditions, Takarazuka, Japan, February 2014
3. S. Merkel, Understanding high pressure plasticity using x-ray diffraction, International Symposium on Plasticity and its Applications, Freeport, Bahamas, January 2014
4. S. Merkel, New experiments for understanding plastic deformation and microstructure under high pressure, European High Pressure Research Group, London, UK, September 2013
5. S. Merkel, C. Nisr, G. Ribarik, T. Ungar, G. Vaughan, P. Cordier, Application of line profile analysis for the study of dislocations in deep Earth minerals, TMS2013, San Antonio, TX, USA, March 2013
6. S. Merkel, Award lecture: 2011 EMU medallist. High pressure plastic behaviour of deep Earth minerals, EMC2012, Frankfurt, Germany, September 2012
7. S. Merkel, Application of Synchrotron Radiation For Understanding The Plastic Properties Of Minerals In The Deep Earth, High Pressure Studies using Synchrotron Radiation: Present and Future, SOLEIL Users' Meeting 2012, Gif-sur-Yvette, France, January 2012
8. S. Merkel, Plasticity under pressure: experiment and models, International Conference of the APS Topical Group on Shock Compression of Condensed Matter, Chicago, IL, USA June 2011
9. S. Merkel, High Pressure Plastic Properties of Hcp Metals: Experiments and Elasto-Plastic Models, TMS 2011 Annual Meeting, San Diego, CA, USA, March 2011
10. S. Merkel, M. Gruson, C.N. Tomé, N. Nishiyama, Y. Wang, Effect of texture on rheological properties: the case of

- ϵ -Fe, American Geophysical Union fall meeting, San Francisco, CA, USA, December 2009
11. S. Merkel, Plastic properties of deep Earth minerals, Symposium of Japanese-French Frontiers of Science, Shonan Village Center, Kanagawa, Japan, January 2009.
 12. S. Merkel, Modeling analysis of the influence of plasticity on x-ray diffraction measurements in high pressure deformation apparatus, Rheology Grand Challenge Workshop on Plastic Deformation of Minerals and the Dynamics of Earth's Deep Interior, MIT, Cambridge, MA, USA, August 2008
 13. S. Merkel, High pressure deformation mechanisms from in situ texture measurements, International Conference on the Texture of Materials (ICOTOM), Pittsburgh, PA, USA, June 2008
 14. S. Merkel, H.R. Wenk, C. Tomé, Evaluation of stress in high pressure radial diffraction experiments: application to Co, Study of Matter at Extreme Conditions, Miami, FL, USA, April 2007
 15. S. Merkel, Plasticity in the diamond anvil cell: implications for deep Earth geophysics, Gordon Research Conference on Research at High Pressure, Biddeford, ME, USA, June 2006
 16. S. Merkel, Radial diffraction in the DAC: practical and theoretical considerations, COMPRESS workshop on rheology and elasticity studies at ultrahigh pressures and temperatures, Advanced Photon Source, Argonne National Laboratory, USA, 2005
 17. S. Merkel, T. Yagi, N. Miyajima, H.R. Wenk, H.K. Mao, and R.J. Hemley, Deformation of polycrystalline Ca-perovskite up to 50 GPa, American Geophysical Union fall meeting, San Francisco, CA, USA, December 2004
 18. S. Merkel, High pressure study of stress, elasticity, and lattice preferred orientations using the diamond anvil cell and x-ray diffraction, IUCr/COMPRES High Pressure Workshop, Non-ambient Crystallography: The Science of Change, Berkeley, CA, USA, December 2003
 19. S. Merkel, H.K. Mao, R.J. Hemley, Finite-element modeling of stress and strain in the diamond anvil cell, International Conferences on High Pressure Science and Technology (Airapt), Honolulu, HI, USA July 1999

INVITED PRESENTATIONS IN FRENCH CONFERENCES: 3

1. S. Merkel, Apports des rayons X à l'étude de microstructures sous haute pression, Colloque Rayons X et Matière, Grenoble, France, Decembre 2015
2. S. Merkel, Études expérimentales de de plasticité aux conditions de de la terre profonde, MECAMAT, Aussois, France, January 2015
3. S. Merkel, Modèles numériques pour l'évaluation de contraintes résiduelles au sein d'échantillons déformés sous pression : application à la phase hexagonale du cobalt, Forum de technologie des hautes pressions, Batz sur Mer, France, 2008

ORAL COMMUNICATIONS GIVEN IN PERSON: 26

1. S. Merkel, N. Hilairt, R. McCabe, C. N. Tomé, Cyclic response of Zn under high pressure and the effect of c/a ratio on hcp metals plasticity, MecaSens, Grenoble, France, Septembre 2015
2. S. Merkel, A. Lincot, P. Cardin, R. Deguen, A self-consistent model of inner core anisotropy, PURE 2015, Londres, Royaume-Uni, Septembre 2015
3. S. Merkel, P. Raterron, N. Hilairt, Creep of minerals : quantifying effects of pressure and grain boundary vs. intracrystalline processes up to 10 GPa and 1600 K in olivine, CREEP 2015, Toulouse, France, June 2015
4. S. Merkel, A. Malpot, A. Rosa, H. P. Liermann, 3D-XRD Investigation of the High Pressure α - ω Transformation in Polycrystalline Titanium, International Congress on 3D Materials Science, Annecy, France, June 2014
5. S. Merkel, A. Lincot, P. Cardin, Inner core anisotropy: scaling single-crystals elastic properties to seismic measurements, AGU Fall Meeting 2013, San Francisco, CA, USA, December 2013
6. S. Merkel, A. Lincot, S. Petitgirard, P. Cardin, BCC-HCP Transition in Fe: Effect of Stress on Transition Mechanisms and Lattice Preferred Orientations, TMS, San Antonio, TX, USA, March 2013
7. S. Merkel, A. Lincot, S. Petitgirard, P. Cardin, Effects of the bcc-hcp transition on textures and anisotropy in Fe, American Geophysical Union fall meeting, San Francisco, CA, USA, December 2012
8. S. Merkel, C. Nisr, G. Ribárik, T. Ungár, G. Vaughan, P. Cordier, In situ experimental study of dislocations in minerals at high pressure, American Geophysical Union fall meeting, San Francisco, CA, USA, December 2011
9. S. Merkel, C. Nisr, P. Cordier, G. Ribarik, T. Ungar, G. Vaughan, In situ 3D X-ray diffraction study of stresses and dislocations in polycrystals under high pressure: application to MgGeO₃ post-perovskite at 80 GPa, MecaSens, Hambourg, Germany, September 2011
10. S. Merkel, M. Gruson, C.N. Tomé, N. Nishiyama, Y. Wang, Textures, contraintes, et mécanismes de déformation plastique dans le fer ϵ , Plasticité, Toulouse, France, March 2010
11. S. Merkel, C.N. Tomé, H.R. Wenk, P. Cordier, Elasto-plastic interpretation of lattice strains measured in non hydrostatic x-ray diffraction data, Study of matter at extreme conditions, Miami - Western Caribbean. March 28 -

April 2, 2009

12. S. Merkel, C.N. Tomé, B. Clausen, H.R. Wenk, A modeling analysis of internal elastic strains in polycrystalline cobalt deformed under high pressure, American Geophysical Union fall meeting, San Francisco, CA, USA, December 2008
13. S. Merkel, Elasto-plastic modeling of stress and strain in samples plastically deformed in the diamond anvil cell, International workshop on high pressure science and technology, Shloss Ringberg, Germany, March 2008
14. S. Merkel, A.K. McNamara, A. Kubo, S. Speziale, L. Miyagi, Y. Meng, T.S. Duffy, and H.R. Wenk, Diamond anvil cell study of the plastic deformation of post-perovskite phases: implication for D'' anisotropy, High Pressure Mineral Physics Seminar, Matsushima, Japan, 2007
15. S. Merkel, Plasticité des minéraux du manteau: expériences de déformation au mégabar, Plasticité, Poitiers, France, 2007
16. S. Merkel L. Miyagi A. Kubo S. Speziale T.S. Duffy H.R. Wenk, Étude expérimental et in-situ des propriétés plastiques de la post-perovskite, Réunion des Sciences de la Terre, Dijon, France, 2006
17. S. Merkel, Joints transparents pour la diffraction radiale en cellule diamant, Forum de technologie des hautes pressions, Monthieux, France, 2006
18. S. Merkel, L. Miyagi, A. Kubo, S. Speziale, T.S. Duffy, H.R. Wenk, High pressure deformation of post-perovskite phases, International Symposium on Experimental Mineralogy, Petrology and Geochemistry (EMPG), Bristol, UK, 2006
19. S. Merkel, T. Yagi, and H.R. Wenk Radial x-ray diffraction study of hcp-cobalt under uniaxial deformation: lattice preferred orientation, stress, and elasticity, Study of Matter at Extreme Conditions, Miami, FL, USA, 2005
20. S. Merkel, A. Kubo, S. Speziale, L. Miyagi, H.R. Wenk, T. Duffy, and H.K. Mao, Plastic deformation of MgGeO₃ post-perovskite at megabar pressures, American Geophysical Union fall meeting, San Francisco, CA, 2005
21. S. Merkel, N. Miyajima, T. Yagi, Deformation of polycrystalline Ca-perovskite up to 50 GPa, Japan Earth and Planetary Science Joint Meeting, Makuhari, Chiba, Japan, 2004
22. S. Merkel, T. Yagi, High pressure deformation of polycrystalline cobalt with the diamond anvil cell, High Pressure Conference of Japan, Yokohama, Japan, 2003
23. S. Merkel, H. R. Wenk, J. Badro, G. Montagnac, P. Gillet, H. K. Mao, and R. J. Hemley , In situ high-pressure deformation studies of deep earth materials by radial X-ray diffraction, Study of Matter at Extreme Conditions, Miami, FL, USA, 2003
24. S. Merkel , Deformation of lower mantle minerals at high pressure, International Union of Geodesy and Geophysics (IUGG), Sapporo, Japan, 2003
25. P. Gillet, S. Merkel, H.R. Wenk, G. Shen, J. Shu, R.J. Hemley, H.K. Mao , The diamond anvil cell as a deformation apparatus for investigating the rheology of the deep Earth, American Geophysical Union fall meeting, San Francisco, CA, USA, 2001
26. S. Merkel, Shu, J, Wenk, H.R., Mao, H.K., Gillet, P., Hemley, R.J. , Diamond anvil cell study of the elasticity and texture of FeS₂ pyrite, European Geophysical Society General Assembly, Nice, France, 2000

POSTER COMMUNICATIONS GIVEN IN PERSON: 19

1. Ph. Cardin, S. Merkel, A. Lincot, R. Deguen, A Multi-scale Self-consistent Model of Earth's Inner Core Anisotropy, AGU Fall meeting, San Francisco, CA, USA December 2015
2. S. Merkel, C. Langrand, N. Hilairret, A. Rosa, Applications of multigrain crystallography for the study of post-perovskite microstructures, AGU Fall meeting, San Francisco, CA, USA, December 2015
3. S. Merkel, A. Lincot, C. Nisr, M. Hanfland, A. Zerr, Shear Deformation of Fe Polycrystals in the Rotational Diamond Anvil Cell, AGU Fall meeting, San Francisco, CA, United States, December 2014
4. A. D. Rosa, S. Merkel, S. Ghosh, N. Hilairret, J. P. Perrillat, N. Mezouar, G. Vaughan, In situ 3D-X-ray diffraction tracking of individual grains of olivine during high-pressure/ high-temperature phase transitions, AGU Fall Meeting, San Francisco, CA, USA, December 2013
5. S. Merkel, C. Nisr, G. Vaughan, G. Ribarik, T. Ungar, P. Cordier, 3D X-Ray Diffraction in the Diamond Anvil Cell, EMC2012, Frankfurt, Germany, September 2012
6. S. Merkel, A. Lincot, P. Cardin, S. Petitgirard, H. P. Liermann, H. R. Wenk, Texture Memory in Iron: Application to Earth inner core, EMC2012, Frankfurt, Germany, September 2012
7. S. Merkel, C. Nisr, G. B. M. Vaughan, G. Ribárick, T. Ungár, P. Cordier, 3D X-Ray Diffraction and In-Situ Microstructural Studies in the Diamond Anvil Cell, Gordon Research Conference on Research at High Pressure, Biddeford, ME, USA, June 2012
8. S. Merkel, C. Nisr, G. Ribarik, T. Ungar, G. Vaughan, P. Cordier, A new method for the experimental study of dislocations in high pressure minerals, American Geophysical Union fall meeting, San Francisco, CA, USA, (2010)
9. S. Merkel, H.P. Liermann, L.M. Miyagi, H.R. Wenk, Plastic deformation of polycrystalline MgO up to 1250 K and 65 GPa, American Geophysical Union fall meeting, San Francisco, CA, USA, December 2009

10. S. Merkel, C.N. Tomé, H.R. Wenk, P. Cordier, Plasticity and stress in gold: application for high pressure experiments, European High Pressure Research Group, Paris, Septembre 2009
11. H. P. Liermann, S. Merkel, L. Miyagi, H.R. Wenk, G. Shen, H. Cynn, W.J. Ewans, In Situ Determination of BCC-, FCC- and HPC-Iron Textures at Simultaneous High- Pressure and –Temperature by Means of the Resistive Heated Radial Diffraction Diamond Anvil Cell (RH-RD-DAC): Implications for the iron core, American Geophysical Union fall meeting, San Francisco, CA, USA, 2008
12. S. Merkel, C.N. Tomé, H.-R. Wenk, Evaluation of stress in high pressure radial diffraction: application to hcp metals, American Geophysical Union fall meeting, San Francisco, CA, USA, 2007
13. S. Merkel, D. Antonangelli, G. Fiquet, T. Yagi, Ultrahigh pressure deformation of polycrystalline hcp-cobalt, American Geophysical Union fall meeting, San Francisco, CA, USA, 2003
14. S. Merkel, H.R. Wenk, P. Gillet, R.J. Hemley, and H.K. Mao , Deformation of silicate perovskite aggregates up to 30 GPa, American Geophysical Union fall meeting, San Francisco, CA, USA, 2002
15. S. Merkel, H.R. Wenk, G. Shen, J. Shu, P. Gillet, R.J. Hemley, H.K. Mao , Diamond anvil cell investigation of lattice strains and preferred orientation in iron at high pressure and temperature, American Geophysical Union fall meeting, San Francisco, CA, USA, 2001
16. S. Merkel S., Hemley, R.J., Mao, H.K., Goncharov, A.F, Wenk, H.R., and Gillet P. , Elasticity and preferred orientation in e-Fe under high pressure, European Union of Geosciences General Assembly, Strasbourg, France, 2001
17. S. Merkel, Somayazulu, M, Shu, J, Ma, YZ, Hemley, RJ, Gillet, P, Mao, HK , Elasticity and rheology of iron at high-pressure from radial x-ray diffraction, American Geophysical Union spring meeting, Washington, DC, USA, 2000
18. S. Merkel, H.R. Wenk, J. Shu, H.K. Mao, R.J. Hemley, P. Gillet , High Pressure properties of FeS₂ pyrite, American Geophysical Union fall meeting, San Francisco, CA, USA, 1999
19. S. Merkel, R.J. Hemley, H.K. Mao, Theoretical study of diamond deformation to multimegabar pressures, American Geophysical Union fall meeting, San Francisco, CA, USA, 1998

PUBLICATIONS

PEER-REVIEWED PUBLICATIONS IN INTERNATIONAL RESEARCH JOURNALS *52, 17 AS 1ST AUTHOR, 11 FROM SUPERVISED STUDENTS AND POST-DOCS*

1. C. Bollinger, P. Raterron, O. Castelnaud, F. Detrez, S. Merkel, Textures in Deforming Forsterite Aggregates up to 8 GPa and 1673 K, *Physics and Chemistry of Minerals*, in press (2016)
2. A. Lincot, Ph. Cardin, R. Deguen, S. Merkel, Multiscale model of global inner-core anisotropy induced by hcp-alloy plasticity, *Geophysical Research Letters*, **43**, (2016) [doi: [10.1002/2015GL067019](https://doi.org/10.1002/2015GL067019)]
3. A. D. Rosa, N. Hilairat, S. Ghosh, G. Garbarino, J. Jacobs, J.-P. Perrillat, G. Vaughan and S. Merkel, In situ monitoring of phase transformation microstructures at Earth's mantle pressure and temperature using multi-grain XRD, *Journal of Applied Crystallography*, **48**, 1346–1354 (2015) [doi: [10.1107/S1600576715012765](https://doi.org/10.1107/S1600576715012765)]
4. S. Merkel and N. Hilairat, Multifit/Polydefix: a Framework for the Analysis of Polycrystal Deformation using X-Rays, *Journal of Applied Crystallography*, **48**, 1307–1313 (2015) [doi: [10.1107/S1600576715010390](https://doi.org/10.1107/S1600576715010390)]
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