

DR. IR. REINOUD LAVRIJSEN

LIST OF PUBLICATIONS, PRESENTATIONS, SUPERVISED STUDENTS (AS PER JUNE 2018)

FIRST-AUTHOR / LAST-AUTHOR

1. [Scanning electron microscopy with polarization analysis for multi-layered chiral spin textures](#)
J. Lucassen, F. Kloodt-Twesten, R. Frompter, H.P. Oepen, R.A. Duine, H. J. M. Swagten, B. Koopmans, R. Lavrijsen
Applied Physics Letters **111**, 132403, (2017)
2. [Periodically modulated ferromagnetic waveguide claddings with perpendicular magnetic anisotropy for enhanced mode conversion](#),
Y.L.W. van Hees, J.J.G.M. van der Tol, B. Koopmans, R. Lavrijsen,
Accepted at IEEE Photonics (2017)
3. [Asymmetric magnetic bubble expansion under in-plane field in Pt/Co/Pt: Effect of interface engineering](#)
R. Lavrijsen, D.M.F. Harmann, A. van den Brink, Y. Yin, M. Verheijen, B. Barcones, R.A. Duine, H. J. M. Swagten, B. Koopmans
Phys. Rev. B **91**, 104414 (2015)
4. [Multi-bit operations in vertical spintronic shift registers](#)
R. Lavrijsen, J-H. Lee, A. Fernandez-Pacheco, D. Petit, R. Mansell, R.P. Cowburn
Nanotechnology **25**, 105201, (2014)
5. [Magnetic ratchet for 3-dimensional spintronics memory and logic](#)
R. Lavrijsen, J-H. Lee, A. Fernandez-Pacheco, D. Petit, R. Mansell, R.P. Cowburn
Nature **494**, 647-650, (2013)
6. [Asymmetric Pt/Co/Pt-stack induced sign-control of current-induced magnetic domain-wall creep](#)
R. Lavrijsen, P.P.J. Haazen, E. Mure, J.H. Franken, J.T. Kohlhepp, H.J.M. Swagten and B. Koopmans
Applied Physics Letters, **100**, 262408, (2012)
7. [Tuning the RKKY-interlayer exchange coupling between single perpendicularly magnetized CoFeB layers](#)
R. Lavrijsen, A. Fernandez-Pacheco, D. Petit, R. Mansell, J.H. Lee, R.P. Cowburn
Applied Physics Letters, **100**, 052411, (2012)
8. [Magnetism in \$\text{Co}_{80-x}\text{Fe}_x\text{B}_{20}\$; effect of crystallization](#)
R. Lavrijsen, P.V. Paluskar, C.T.J. Loermans, P.A. van Kruisbergen, J.T. Kohlhepp, H.J.M. Swagten and B. Koopmans.
Journal of Applied Physics, **109**, 093905, (2011)
9. [Enhanced -field driven domain-wall motion in Pt/Co₆₈B₃₂/Pt strips](#)
R. Lavrijsen, J.T. Kohlhepp, H.J.M. Swagten and B. Koopmans.
Applied Physics Letters, **98**, 132502, (2011)
10. [Fe:O:C grown by focused-electron-beam-induced deposition: magnetic and electric properties](#)
R. Lavrijsen, R. Cordoba, F. J. Schoenaker, T. Ellis, B. Barcones-Campo, J.T.

Kohlhepp, H.J.M. Swagten, B. Koopmans, J.M. De Teresa, C. Magen, M.R. Ibarra, P. Trompenaars and J.J.L. Mulders.

Nanotechnology, **22**, 025302, (2011).

11. [Controlled domain wall injection in perpendicularly magnetized strips](#)
R. Lavrijsen, J.H. Franken, J. T. Kohlhepp, H. J. M. Swagten, B. Koopmans
Applied Physics Letters **96**, 222502, (2010)
12. [Reduced domain wall pinning in ultrathin Pt/Co_{100-x}B_x/Pt with perpendicular magnetic anisotropy](#)
R. Lavrijsen, G.Malinowski, J.H. Franken, J. T. Kohlhepp, H. J. M. Swagten, B. Koopmans, M. Czapkiewicz, T. Stobiecki
Applied Physics Letters **96**, 022501, (2010)

CO-AUTHOR

13. [Synthesis of Ni Nanoparticles with Controllable Magnetic Properties by Atmospheric Pressure Microplasma Assisted Process](#)
L. Liu, S. Li, S.A. Starostin, R. lavrijsen, W. Wang, V. Hessel
American Society of Chemical Engineers (AIChE) (2017)
14. [Versatile microfluidic flow generated by moulded magnetic artificial cilia](#),
S.Z. Zhang, Y. Wang, R. Lavrijsen, P.R. Onck, J.M.J. den Toonder
Sensors and Actuators B – Chemical (2017)
15. [Deterministic all-optical switching of synthetic ferrimagnets using single femtosecond laser pulses](#)
M.L.M. Laliou, M.J.G. Peeters, S.R.R. Haenen, R. Lavrijsen, B. Koopmans
Physical Review B, **96**, 220411 (2017)
16. [Sputter grown Fe and Cr/Fe multilayers with fourfold magnetic anisotropy on GaAs](#),
R.H. Mansell, D.C.M.C. Petit, A. Fernandez-Pacheco, R. Lavrijsen, J.H. Lee, R.P. Cowburn
IEEE transactions on magnetics, **54** 2000105 (2018)
17. [Thickness dependence of unidirectional spin-Hall magnetoresistance in metallic bilayers](#)
Y.Yin, D.-S. Han, M.C.H. de Jong, R. Lavrijsen, R.A. Duine, H.J.M. Swagten, Bert Koopmans
Applied Physics Letters, **111**, 232405 (2017)
18. [The Electrochemistry of Iron Oxide Thin Films Nanostructured by High Ion Flux Plasma Exposure](#)
R. Sinha, I. Tanyeli, R. Lavrijsen, R. van der Sanden, A. Bieberle
Electrochimica Acta, **258** 709-717 (2017)
19. [Fabrication, Detection, and Operation of a Three-Dimensional Nanomagnetic Conduit](#),
D. Sanz-Hernández, R.F. Hamans, J.-W. Liao, A. Welbourne, R. Lavrijsen, and Amalio Fernández-Pacheco
ACS Nano (2017)
20. [Visible-light-promoted gas-phase water splitting using porous WO₃/BiVO₄ photoanodes](#)
T. Stoll, G. Zafeiropoulos, I. Dogan, H. Genuit, R. Lavrijsen, B. Koopmans, M.N.

- Tsampas
Electrochemistry Communications 82, 47-51, (2017)
21. [Nanostructuring of iron thin films by high flux low energy helium plasma](#)
 A. Bieberle-Hutter, I. Tanyeli, R. Lavrijsen, B. Koopmans, R. Sinha, M.C.M. van de Sanden
Thin Solid Films 631, 50-56, (2017)
 22. [Vector magnetometry of Fe/Cr/Fe trilayers with biquadratic coupling](#)
 R. Mansell, D.C.M.C. Petit, A. Fernandez-Pacheco, J.H. Lee, S.L. Chin, R. Lavrijsen, R.P. Cowburn
Journal of Physics D-Applied Physics 50, 19LT02, (2017)
 23. [Zigzag Domain Wall Mediated Reversal in Antiferromagnetically Coupled Layers](#)
 R. Mansell, A. Fernandez-Pacheco, D.C.M.C. Petit, N.J. Steinke, J.H. Lee, R. Lavrijsen, R.P. Cowburn
IEEE Magnetics Letters 8, 4102304, (2017)
 24. [Chiral Magnetoresistance in Pt/Co/Pt zigzag wires](#)
 Y. Yin, D-S. Han, J-S. Kim, R. Lavrijsen, K-J. Lee, S-W. Lee, K-W. Kim, H-W. Lee, H.J.M. Swagten, B. Koopmans
Applied Physics Letters 110, 122401, (2017)
 25. [Systematic layer-by-layer characterisation of multilayers for three-dimensional data storage and logic](#)
 D. Petit, R. Lavrijsen, J. H. Lee, R. Mansell, A. Fernandez-Pacheco, R. P. Cowburn
Nanotechnology 27, 155203, (2016)
 26. [Thickness dependence of the interfacial Dzyaloshinskii-Moriya interaction in inversion symmetry broken systems](#)
 J. Cho, N-H. Kim, S. Lee, J-S. Kim, R. Lavrijsen, A. Solignac, Y. Yin, D-S. Han, N. J. J. van Hoof, H. J. M. Swagten, B. Koopmans, C-Y. You
Nature Communications 6, 7635, (2015)
 27. [A robust soliton ratchet using combined antiferromagnetic and ferromagnetic interlayer couplings](#)
 R. Mansell, R. Lavrijsen, A. Fernandez-Pacheco, D. C. M. C. Petit, J. H. Lee, B. Koopmans, H. J. M. Swagten, R. P. Cowburn
Applied Physics Letters 106, 092404, (2015)
 28. [Magnetic properties and interlayer coupling of epitaxial Co/Cu films on Si](#)
 R. Mansell, D. Petit, A. Fernandez-Pacheco, R. Lavrijsen, J.H. Lee, R. P. Cowburn
Journal of Applied Physics, 116, 063906, (2014)
 29. [Soliton propagation in micron-sized magnetic ratchet elements](#)
 J.-H. Lee, D. Petit, R. Lavrijsen, A. Fernandez-Pacheco, R. Mansell, R.P. Cowburn
Applied Physics Letters, 104, 232404, (2014)
 30. [Beam-Induced Fe Nanopillars as Tunable Domain-Wall pinning Sites](#)
 J.H. Franken, M.A.J. van der Heijden, T.H. Ellis, R. Lavrijsen, C. Daniels, D. McGrouther, H.J.M. Swagten, B. Koopmans
Advanced Functional Materials 24, 23, 3508-3514, (2014)
 31. [Domain Imaging during soliton propagation in a 3D magnetic ratchet](#)
 J.-H. Lee, R. Mansell, D. Petit, A. Fernandez-Pacheco, R. Lavrijsen, R. P. Cowburn
SPIN, Vol 3, No. 4, 134001, (2013)
 32. [Domain wall depinning governed by the spin Hall effect](#)
 P.P.J. Haazen, E. Mure, J.H. Franken, R. Lavrijsen, H.J.M. Swagten, B. Koopmans
Nature Materials 12, 299-303, (2013)

33. [Magnetic states in low-pinning high-anisotropy magnetic nanostructures suitable for dynamic imaging](#)
F. Buttner, C. Moutafis, A. Bisig, P. Wohlhuter, C.M. Gunther, J. Mohanty, J. Guilhufe, M. Schneider, C.V. Schmising, S. Schaffert, B. Pfau, M. Hantschmann, M. Riemeier, M. Emmel, S. Finizio, G. Jakob, M. Weigand, J. Rhensius, J.H. Franken, R. Lavrijsen, H.J.M Swagten, H. Stoll, S. Eisebitt, M. Klaui
Physical Review B, **87**, 134422, (2013)
34. [Controllable nucleation and propagation of topological magnetic solitons in CoFeB/Ru ferrimagnetic superlattices](#)
A. Fernandez-Pacheco, D. Petit, R. Mansell, R. Lavrijsen, J.H. Lee, R.P. Cowburn
Physical Review B, **86**, 104422, (2012)
35. [Giant anomalous Hall effect in Fe-based microwires grown by focused-electron-beam-induced deposition](#)
R. Cordoba, R. Lavrijsen, A. Fernandez-Pacheco, M.R. Ibarra, F. J. Schoenaker, T. Ellis, B. Barcones-Campo, J.T. Kohlhepp, H.J.M. Swagten, B. Koopmans, J.J.L. Mulders and J.M. De Teresa
Journal of Physics D: Applied Physics. **45**, 035001, (2012)
36. [Domain-Wall pinning by local control of anisotropy in Pt/Co/Pt strips](#)
J.H. Franken, M. Hoeijmakers, R. Lavrijsen, H.J.M. Swagten
Journal of Physics: Condensed matter, **24**, 024216, (2012)
37. [Precise control of domain wall injection and pinning using helium and gallium focused ion beams](#)
J.H. Franken, M. Hoeijmakers, R. Lavrijsen, J. T. Kohlhepp, H. J. M. Swagten, B. Koopmans
Journal of Applied Physics, **109**, 07D504, (2011)
38. [Tunable magnetic domain wall oscillator at an anisotropy boundary](#)
J.H. Franken, R. Lavrijsen, J. T. Kohlhepp, H. J. M. Swagten, B. Koopmans
Applied Physics Letters, **98**, 102512, (2011)
39. [Spin motive forces due to magnetic vortices and domain walls](#)
M.E. Lucassen, G.C.F.L. Kruis, R. Lavrijsen, H.J.M. Swagten, B. Koopmans and R.A. Duine
Physical Review B, **84**, 014414 (2011)
40. [Correlation between Magnetism and Spin-Dependent Transport in CoFeB Alloys](#)
P.V. Paluskar, R. Lavrijsen, M. Sicot, J. T. Kohlhepp, H.J.M. Swagten, and B. Koopmans
Physical Review Letters **102**, 016602 (2009)
41. [Magnetization Dynamics and Gilbert damping in ultrathin Co₄₈Fe₃₂B₂₀ films with out-of-plane anisotropy](#)
G. Malinowski, K.C. Kuiper, R. Lavrijsen, H.J.M. Swagten, B. Koopmans
Applied Physics Letters **94**, 102501 (2009)
42. [Tunneling spin polarization and annealing of Co₇₂Fe₈B₂₀](#)
H.J.M. Swagten, P.V. Paluskar, R. Lavrijsen, J.T. Kohlhepp, B. Koopmans
Journal of Magnetism and Magnetic Materials **310** (2, Pt. 3), 2012-2014 (2007)

ACCEPTED

1. [Versatile microfluidic flow generated by moulded magnetic artificial cilia](#), S. Zhang, Y. Wang, R. Lavrijsen, P. Onck, J. den Toonder, under review at **Actuators and Sensors B**

UNDER REVIEW

1. [Anti-ferromagnetically coupled domain walls in perpendicular bilayers](#), D. Petit, K.D. Hakkel, [R. Lavrijsen](#) et al., under review at **Applied Physics Letters (2017)**

PRESENTATIONS

- i. ***(Invited)* All-optical switching in Co/Gd bilayers and chirality determination using SEMPA**, [R. Lavrijsen](#), et al.
M-SNOWS, Nancy, France
(September 2018)
- ii. ***(Invited)* On spin-orbit torques, chiral magnetization textures and e-control of magnetization in ultrathin multilayers**
[R. Lavrijsen](#), H.J.M. Swagten, B. Koopmans
International Conference on Nanoscale Magnetism, Turkey
(September 2016) cancelled due to political situation in Turkey
- iii. **Manipulating the RKKY coupling strength by electric fields**
[R. Lavrijsen](#), M. Laliu, R. Raijmakers, H.J.M. Swagten, B. Koopmans
IEEE 2016 International Symposium On Metallic Multilayers, Uppsala, Sweden
(June 2016)
- iv. ***(Invited)* Asymmetric exchange in Pt/Co/Ir/Pt multilayers**
[R. Lavrijsen](#), R. Duine, H.J.M. Swagten, B. Koopmans
Wiesendanger group Symposium, Hamburg, Germany
(June 2015)
- v. ***(Invited)* Domain-walls, magnetic bubbles, and the Dzyaloshinskii-Moriya interaction?**
[R. Lavrijsen](#), D. Hartmann, R. Duine, H.J.M. Swagten, B. Koopmans
SPRING2015, Spring meeting EMRS, Lille, France
(May 2015)
- vi. ***(Invited)* Symmetric exchange and charging the interlayer exchange coupling**
[R. Lavrijsen](#), D. Hartmann, R. Duine, H.J.M. Swagten, B. Koopmans
Thin Film Magnetization Group Symposium, Cambridge, UK
(March 2015)
- vii. **Tuning asymmetric exchange: towards an ideal racetrack memory?**
[R. Lavrijsen](#), H.J.M. Swagten, B. Koopmans
COBRA symposium, TU/e, Eindhoven, The Netherlands
(February 2015)
- viii. ***(Invited)* Domain-wall depinning governed by the spin Hall effect and Dzyaloshinskii-Moriya interaction**
[R. Lavrijsen](#), J.H. Franken, D. Hartmann, R. Duine, H.J.M. Swagten, B. Koopmans
59th Annual Magnetism & Magnetic Materials Conference, Honolulu, Hawaii
(November 2014)
- ix. ***(Invited)* On domain-walls and spin-orbit torques**
[R. Lavrijsen](#), H.J.M. Swagten, P.J. Haazen, E. Mure, J.H. Franken, B. Koopmans
Deutsche Physikalische Gesellschaft Spring Meeting, Dresden, Germany

- (April 2014)
- x. **On spin-orbitronics and 3D soliton ratchets**
R. Lavrijsen, H.J.M. Swagten, P.J. Haazen, E. Mure, J.H. Franken, B. Koopmans, J-H. Lee, A. Fernandez-Pacheco, D. Petit, R. Mansell, R.P. Cowburn
 Physics@FOM Meeting, Veldhoven, The Netherlands
 (January 2014)
- xi. **(Invited) On spin-orbitronics, soliton ratchets and domain walls**
R. Lavrijsen; Workshop: Spintronics: Its Frontiers, Challenges and Opportunities
 Nanyang Technological University Singapore, Singapore
 (January 2014)
- xii. **(Invited) Domain-wall depinning governed by the spin Hall effect**
R. Lavrijsen, H.J.M. Swagten, P.J. Haazen, E. Mure, J.H. Franken, B. Koopmans
 Joint European Magnetism Symposia, Rhodes, Greece
 (August 2013)
- xiii. **(Invited) Multiple soliton propagation through a magnetic superlattice**
R. Lavrijsen, J-H. Lee, A. Fernandez-Pacheco, D. Petit, R. Mansell, R.P. Cowburn
 IEEE 2013 International Symposium On Metallic Multilayers, Kyoto, Japan
 (May 2013)
- xiv. **(Invited) Towards fully 3-dimensional spintronics - MRAM**
R. Lavrijsen, J-H. Lee, A. Fernandez-Pacheco, D. Petit, R. Mansell, R.P. Cowburn
 IMEC, Leuven, Belgium
 (December 2012)
- xv. **3D spintronics: Perpendicularly magnetized soliton ratchet**
R. Lavrijsen, J-H. Lee, A. Fernandez-Pacheco, D. Petit, R. Mansell, R.P. Cowburn
 Joint European Magnetic Symposia, Parma, Italy
 (September 2012)
- xvi. **Single perpendicularly magnetized CoFeB layers for 3D spintronics**
R. Lavrijsen, A. Fernandez-Pacheco, D. Petit, J-H. Lee, R. Mansell, R.P. Cowburn
 Intermag, IEEE International Magnetism Conference, Vancouver, Canada
 (May 2012)
- xvii. **Domain walls in perpendicularly magnetized stripes violating spin-transfer torque?**
R. Lavrijsen, J.T. Kohlhepp, H.J.M. Swagten, B. Koopmans
 55th Annual Conference on Magnetism & Magnetic Materials, Atlanta, USA
 (November 2010)
- xviii. **(Invited) Domain walls in perpendicularly magnetized stripes violating spin-transfer torque?**
R. Lavrijsen, J.T. Kohlhepp, H.J.M. Swagten, B. Koopmans
 IEEE 2010 International Symposium On Metallic Multilayers, Berkeley, USA
 (September 2010)
- xix. **Perpendicular Pt / CoFeB / Pt, a tunable system for domain wall dynamics**
R. Lavrijsen, G. Malinowski, J.T. Kohlhepp, H.J.M. Swagten, B. Koopmans
 53rd Annual Conference on Magnetism & Magnetic Materials, Austin, Texas, USA
 (November 2008)

SUPERVISED MASTER/BACHELOR STUDENTS

1. M.Sc. Michael Beljaars (2008), *Electron beam induced deposition of Iron*
2. B.Sc. Joris Jongen (2008), *Quantitative Magnetic Force Microscopy*
3. B.Sc. Rik Paesen (2008), *Field driven and current induced domain wall motion*
4. M.Sc. Coen Loermans (2009), *Magnetic properties of perpendicularly magnetized ultrathin Pt/CoFeB/Pt films*
5. M.Sc. Paul Janssen (2009), *The nanostencil process*
6. B.Sc. Tim Weekenstro (2009), *Ion Beam Milling*
7. B.Sc. Roger Bosch (2009), *Determination of the magnetic properties of EBID-deposited Fe nanowires through the AMR effect*
8. B.Sc. Can Avci (2009), *Magnetic characterization of Co/Pt single layer with perpendicular magnetization*
9. M.Sc. Frank Schoenaker (2010), *Exploring the fabrication of ferromagnetic nanostructures by Electron Beam Induced Deposition*
10. M.Sc. Jeroen Franken (2010), *Domain wall motion in perpendicularly magnetized ultrathin Pt/CoFeB/Pt films*
11. M.Sc. Paul Soto (2010), *Nano-stencil fabrication for spin-torque devices*
12. M.Sc. Geerit Kruis (2011), *Racing domain walls*
13. M.Sc. Tim Ellis (2011), *Novel Deposition of Magnetic Nanostructures*
14. B.Sc. Mark Lalieu (2012), *Towards a working 3D data storage device*
15. B.Sc. Dion Hartmann UU (2014), *Domain-wall motion in materials with perpendicularly magnetic anisotropy*
16. M.Sc. Mark Lalieu (2014), *Charging the interlayer exchange coupling*
17. M.Sc. Juriaan Lucassen (2015), *Determining the Spin Hall Effect using superconducting tunnelling spectroscopy*
18. M.Sc. Dorris Slapak (2016), *Growing BaTiO₃ for future magnetic memory devices*
19. M.Sc. Guido Hendriks (2016), *Synthetic-Multiferroic heterostructures with the Spin Hall Effect*
20. M.Sc. Pim van Nispen (2017), *Characterising the Dzyaloshinskii-Moriya effect by magnetic bubble expansion*
21. M.Sc. Rens Raijmakers (2016), *Tunable interlayer exchange coupling*
22. M.Sc. Paul de Brouwer (2017), *Tunable interlayer exchange coupling*
23. B.Sc. Jelte Schlatmann (2017) *3D vector magnet for anisotropy mapping*
24. B.Sc. Amber Heskens (2018) *Theory for 3D magnonics (together with Rembert Duine)*
25. M.Sc. Youri van Hees (2018) *Magnetic claddings for photonic integrated circuits*
26. B.Sc. Jan van Mastriigt (2018) *Characterising Magnetic NanoPlatelets*
27. Rick Ernst (M.Sc. Expected 2018), *Magnetic SAF nanoparticles or bio and cancer treatment*
28. Huub van der Veecken (B.Sc. Expected 2018), *Characterising Co/Gd Ferrimagnetic systems*

Non-refereed articles

1. **Driedimensionale Chips**
R. [Lavrijsen](#), *N! Periodieke uitgave VENI*, 2014
2. **Driedimensionale Chips!**
R. [Lavrijsen](#), *NTvN*, 2014

3. MgO als Tunnel Barriere

R. Lavrijsen, H.J.M. Swagten, P.V. Paluskar, B. Koopmans, NEVAC blad, 2008

Other**1. Studium Generale**, Lezing over NanoMagnetisme, June 2018**2. Magneetjes bouwen**

Antje Veld, R. Lavrijsen, *Experiment NL*, 2015

3. Een spintronics flatgebouw

Tom Jeltens, R. Lavrijsen, *CURSOR, TU/e*, 2014

4. Winner National quiz (National TV)

VPRO, December 2016

5. PhD over the years

Antoinnette van der Vorst, R. Lavrijsen, *SLASH, TU/e Alumni paper* September 2017