ROBERTO FALLICA

R&D ENGINEER SPECIALIZED IN CHARACTERIZATION AND FABRICATION OF NANOSCALE DEVICES

I design, conduct and analyze complex experiments to improve the patterning materials used in next-generation semiconductor devices.

Key Professional Skills

1 - More than 15 year experience in lithography and semiconductor manufacturing in world-class labs and fabs.
2 - Highly organized, multitasking, and with strong attention to detail.
3 - Aware of importance of key performance indicators (KPI), corporate goals and business needs.
4 - Proven communication skills to interact with stakeholders & customers at any level of the corporate ladder.
5 - Customer-oriented: planning, drafting and managing joint projects (*technical annexes* and *scope of work*).

Work Experience

Position	**R&D Engineer**
Employer	IMEC, Leuven (Belgium)
Date	Apr. 2018 to present
Achievements	✓ *Drafting and executing Statements of Work for joint development projects (JDP) with industry.*
	✓ *Initiator of JDP with new materials suppliers in the ecosystem of EUV lithography.*
	✓ *Enabled high-density DRAM devices by patterning dense array at pitch 32 nm by EUV lithography.*
	✓ *Demonstrated defectivity below 10^{-8} of contact holes patterns at 38 nm pitch resolution for DRAM.*
	✓ *Study of light-matter interaction by photoelectron spectroscopy: mean free path in photoresists.*
	Postdoctoral Fellow
	Paul Scherrer Institute (PSI), Villigen (Switzerland)
	Sept. 2014 to Jan. 2018
	✓ *Devised a novel methodology to measure absorption coefficient of materials during exposure to EUV*
	✓ *Demonstrated unprecedented single digit (≤ 9 nm) resolution patterning of metal-oxide photoresist*
	✓ *Improved optical resolution from 16 nm to 7 nm half pitch by fabrication of lithography masks*
	✓ *Studied photo-induced condensation of metal-oxide photoresists by X-ray absorption spectroscopy*
	Postdoctoral Fellow
	National Research Council of Italy (CNR), Agrate Brianza (Italy)
	Jan. 2012 to Aug. 2014
	✓ *Electrical test vehicle for the characterization of nanometer-scale phase-change memory cells*
	Research Assistant
	National Research Council of Italy (CNR), Agrate Brianza (Italy)
	Jun. 2007 to Dec. 2008
	✓ *Designed and assembled apparatus for electrical measurements of thin films from 4 to 1000 K*

Education

Title	**Ph.D., Nanostructures and Nanotechnologies**
Institution Date	Department of Materials Science, Università di Milano-Bicocca, Milano (Italy)
Thesis	Jan. 2009 to Jan. 2012
Main classes	"Characterization of Chalcogenide Phase Change Nanostructures" (link)
	Self-assembled nanomaterials, Project management, IP protection, Science communication.
	Visiting PhD Student
	University of Pennsylvania, Philadelphia (USA) *Supervisor: Prof. Ritesh Agarwal*
	May 2011 to Aug. 2011
	M.S. Electronics Engineering
	Politecnico di Milano, Milano (Italy)
	Jun. 2007
	"Thermal Characterization of Phase Change Materials by the 3 ω Method" (link)
	Analog Electronics, Digital Electronics, Solid State Physics, Electronics Instrumentation and Measurements.

Additional training and professional development

2024	LE^{2}AP conference: committee member and co-organizer, Leuven (Belgium), 9-11 Sept 2024.
2022	ICECS IEEE International Conference on Electronic Circuits and Systems: Session Chair (Glasgow, UK)
2019	ELENA conference (ELEctron-driven chemistry for Nano fabrication methods): organizing committee.
2015	E-MRS2015 conference: Scientific committee member of Symposium AA, Strasbourg (France)
since 2010	Institute of Electrical and Electronics Engineers (IEEE): senior member #90751195.
2007	Professional engineering license (Italy), granted by Politecnico di Milano.

Role in Joint Development Projects with academia and industry

Name	**5. Advanced Patterning Center (APC)**
Duration	2018-2021 (multi-year)
Type	Industrial R&D project between IMEC and ASML, Veldhoven (The Netherlands).
Role(s)	*Work package owner: high density, single exposure EUV patterning for DRAM applications.*
	4. Inpria Corp.
	Sept. 2014 – Aug. 2016 (2 year-project)
	Industrial R&D program between Paul Scherrer Institute and Inpria Corp., Corvallis OR (USA).
	Key person of task: experimental, data analysis, reporting.
	3. Synthesis and functionality of chalcogenide nanostructures for phase change memories
	Dec. 2012 – Nov. 2015
	Academic €3.5M project, European Commission Framework Programme 7, grant #310339.
	Experimental activity, preparation, and submission of project proposal.
	2. Micron Technologies, Inc.
	2008 – 2014 (renewed yearly)
	Industrial R&D project with Micron Technologies, Agrate Brianza (Italy) and Boise ID (USA)
	Key person of task: experimental, data analysis, instrumentation, reporting, development.
	1. Chemical Vapor Deposition of Chalcogenide Materials for Phase-change Memories
	2006 – 2008 (3 year-project)
	Academic project funded by European Commission Framework Programme 6, grant #IST-027561.
	Design and assembly of instrumentation, data collection, reporting.

Computer & Software Proficiencies

- Windows 7/Vista/XP. Linux. MS-DOS.
- Microsoft Office 365 (Word, Excel, PowerPoint, Access)
- MATLAB
- LaTeX
- LabVIEW
- COMSOL Multiphysics
- OriginLab Origin
- JMP

Languages

Mother tongue	Italian
Other tongues	English: internet based TOEFL, score 106/120 (C1). French: basic knowledge (A2). German: basic knowledge (A1).

Academic achievements

Book chapters

[B2] E. Buitrago, T. S. Kulmala, R. Fallica, and Y. Ekinci; Chapter 6: *EUV Lithography Process Challenges*. In: Frontiers of Nanoscience: Materials and Processes for Next Generation Lithography, edited by Alex J. P. Robinson, 18 Nov 2016, Elsevier (ISBN 9780081003541).
[B1] Contributions to Chapter 7: *Nanowire phase change memory (PCM) technologies: properties and performance*. In: Advances in non-volatile memory and storage technology, edited by Yoshio Nishi, 12 June 2014, Elsevier (ISBN 0857098098).

Invited

[I6] R. Fallica, invited contribution to the Elettra Highlights booklet 2023-2024 (in print).
[I5] R. Fallica, *Characterization of EUV materials: from well-established to pioneering methods*; online seminar for the CHiPPS (Center for High Precision Patterning Science), 22 May 2024.
[I4] R. Fallica, *Mean Free Path of Electrons in Organic Photoresists for Extreme Ultraviolet Lithography in the Kinetic Energy Range 20−450 eV*; at LEE2023 (Low-energy electrons) conference, 20 Nov 2023, Rome (Italy).
[I3] R. Fallica, *Electron distribution of EUV photoresist during exposure: a model*; at LEELIS-IV (Low-energy electrons: Lithography, Imaging, and Soft Matter), 17-19 Nov 2021, Amsterdam (Netherlands).
[I2] R. Fallica, *High-resolution grayscale patterning using extreme ultraviolet interference lithography*; at International Workshop on Advanced 3D Patterning, TU Dresden, 5-6 Oct 2017, Dresden (Germany).
[I1] R. Fallica, *EUV lithography: Enabling next generation lithography at the XIL beamline, from single-digit resolution to materials characterization*; at International School on Nano-Tooling, CNR-ISASI, 30 March 2017, Pozzuoli (Italy).

Papers (peer-reviewed)

[35] R. Fallica, N. Mahne, T. Conard, A. Vanleenhove, D. De Simone, and S. Nannarone, *Mean Free Path of Electrons in Organic Photoresists for Extreme Ultraviolet Lithography in the Kinetic Energy Range 20−450 eV*, ACS Appl. Mater. Interfaces 15, 35483 (2023)
[34] R. Fallica, D. De Simone, S. Chen, M. Safdar, and H. S. Suh, *Scaling and readiness of underlayers for high-NA EUV lithography*, J. Micro/Nanopattern. Mater. Metrol. 21(4), 044601-1 (2022)
[33] R. Fallica, S. Chen, D. De Simone, and H. S. Suh, *Adhesion and collapse of extreme ultraviolet photoresists and the role of underlayers*, J. Micro/Nanopattern. Mater. Metrol. 21(3), 034601-1 (2022)
[32] R. Fallica, S. Nannarone, N. Mahne, A. M. Malvezzi, A. Berti, D. De Simone, *Evolution of Secondary Electrons Emission During EUV Exposure in Photoresists*, Journal of Photopolymer Science and Technology 34(1), 99 (2021).
[31] B. Rösner, R. Fallica, M. Johnson, A. Späth, R. Fink, Y. Ekinci, C. David, M. H. Anjass and C. Streb, *Nanolithographic Top-Down Patterning of Polyoxovanadate-Based Nanostructures with Switchable Electrical Resistivity*, ChemNanoMat 6, 1620 (2020).
[30] A. Rathore, I. Pollentier, H. Singh, R. Fallica, D. De Simone and S. De Gendt, *Effect of molecular weight on the EUV-printability of main chain scission type polymers*, Journal of Materials Chemistry C 8, 5958 (2020).
[29] J. Jiang, G. Giordano, R. Fallica, D. De Simone, and G. Vandenberghe, *Sensitizer for EUV Chemically Amplified Resist: Metal versus Halogen*, Journal of Photopolymer Science and Technology 32(1), 21 (2019).
[28] R. Fallica, *Beyond grayscale lithography: inherently three-dimensional patterning by Talbot effect*, Advanced Optical Technologies, 0005 (2019).
[27] R. Fallica, and Y. Ekinci, *Photoacid generator-polymer interaction on the quantum yield of chemically amplified resists for extreme ultraviolet lithography*, J. Mater. Chem. C 6, 7267 (2018).
[26] R. Fallica, B. Watts, B. Roesner, G. Della Giustina, L. Brigo, G. Brusatin, and Y. Ekinci, *Changes in the near edge X-ray absorption fine structure of hybrid organic-inorganic resists upon exposure*, Nanotechnology 29, 36LT03 (2018).
[25] R. Fallica, J. Haitjema, L. Wu, S. Castellanos, A. M. Brouwer, and Y. Ekinci, *Absorption coefficient of metal-containing photoresists in the extreme ultraviolet*, J. Micro/Nanolith. MEMS MOEMS 17(2), 023505 (2018)
[24] R. Fallica, D. Kazazis, R. Kirchner, A. Voigt, I. Mochi, H. Schift, and Y. Ekinci, *Lithographic performance of ZEP520A and mr-PosEBR resists exposed by electron beam and extreme ultraviolet lithography*, Journal of Vacuum Science and Technology B 35(6), 06G501 (2017).
[23] R. Mantovan, R. Fallica, C. Wiemer, M. Longo, A. M Gerami, T. E. Mølholt, H. P. Gunnlaugsson, K. Johnston, H. Masenda, M. Ncube, K. Bharuth-Ram, M. Fanciulli, H. P. Gislason, G. Langouche, D. Naidoo, S. Ólafsson, and G. Weyer, *Atomic-scale study of the amorphous-to-crystalline phase transition mechanism in GeTe thin films*; Scientific Reports 7, 8234 (2017).
[22] N. Chidambaram, R. Kirchner, R. Fallica, L. Yu, M. Altana and H. Schift; *Selective surface smoothening of polymer microlenses by depth confined softening*; Advanced Materials Technologies 1700018 (2017).
[21] R. Fallica, R. Kirchner, H. Schift, and Y. Ekinci; *High-Resolution Grayscale Patterning using Extreme Ultraviolet Interference Lithography*; Microelectronic Engineering 177, 1 (2017).
[20] R. Fallica, R. Kirchner, D. Mailly, and Y. Ekinci; *Comparative study of resists and lithographic tools using the Lumped Parameter Model*; Journal of Vacuum Science & Technology B 34, 06K702 (2016).
[19] R. Fallica, E. Buitrago, and Y. Ekinci; *Comparative study of line roughness metrics of chemically amplified and inorganic resists for extreme ultraviolet*; J. Micro-Nanolith. MEM. 15(3), 034003 (2016).
[18] R. Fallica, J. K. Stowers, A. Grenville, A. Frommhold, A. J. P. Robinson, and Y. Ekinci, *Dynamic absorption coefficient of CAR and non-CAR resists at EUV*; J. Micro-Nanolith. MEM. 15(3), 033506 (2016).
[17] J.-L. Battaglia, A. Kusiak, C. Gaborieau, Y. Anguy, H. T. Nguyen, C. Wiemer, R. Fallica, D. Campi, M. Bernasconi, M. Longo, *Evolution of thermal conductivity of $In_3Sb_\beta Te_\gamma$ thin films up to 550 °C*; Phys. Status Solidi-R. 10(7), 544 (2016).
[16] E. Buitrago, R. Fallica, D. Fan, T. S. Kulmala, M. Vockenhuber, Y. Ekinci, *SnOx high-efficiency EUV interference lithography gratings towards the ultimate resolution in photolithography*; Microelectronic Engineering 155, 44 (2016).
[15] J. Passarelli, M. Murphy, R. Del Re, M. Sortland, J. Hotalen, L. Dousharm, R. Fallica, Y. Ekinci, M. Neisser, D. A. Freedman, R. L. Brainard, *Organometallic carboxylate resists for extreme ultraviolet with high sensitivity*; J. Micro-Nanolith. MEM. 14(4), 043503 (2015).
[14] T. S. Kulmala, M. Vockenhuber, E. Buitrago, R. Fallica, Y. Ekinci, *Toward 10 nm half-pitch in extreme ultraviolet lithography: results on resist screening and pattern collapse mitigation techniques*; J. Micro-Nanolith. MEM. 14(3), 033507 (2015).
[13] E. Rotunno, M. Longo, C. Wiemer, R. Fallica, D. Campi, M. Bernasconi, A. Lupini, S. Pennycook, L. Lazzarini, *A novel Sb_2Te_3 polymorph stable at the nanoscale*; Chemistry of Materials 27, 4368 (2015).
[12] J.-L. Battaglia, A. Kusiak, A. Saci, R. Fallica, A. Lamperti and C. Wiemer, *Effect of a thin Ti interfacial layer on the thermal resistance of $Ge_2Sb_2Te_5$-TiN stack*; Applied Physics Letters 105, 121903 (2014).
[11] A. Saci, J.-L. Battaglia, A. Kusiak, R. Fallica, and M. Longo, *Thermal conductivity measurement of a Sb_2Te_3 phase change nanowire*; Applied Physics Letters 104, 263103 (2014).
[10] R. Fallica, C. Wiemer, T. Stoycheva, E. Cianci, M. Longo, H. T. Nguyen, and J.-L. Battaglia, *Thermal properties of In-Sb-Te films and interfaces for phase change memory devices*; Microelectronic Engineering, 120, 3 (2014).
[9] R. Fallica, E. Varesi, L. Fumagalli, S. Spadoni, M. Longo, and C. Wiemer, *Effect of nitrogen doping on the thermal conductivity of GeTe thin films*; Phys. Status Solidi-R. 7, 1107 (2013).
[8] R. Fallica, T. Stoycheva, C. Wiemer, and M. Longo, *Structural and electrical analysis of In–Sb–Te-based PCM cells*; Phys. Status Solidi-R. 7, 1009 (2013).
[7] T. Stoycheva, M. Longo, R. Fallica, F. Volpe, C. Wiemer, *Growth study and characterization of In-Sb-Te compound deposited onto different substrates by Metal-Organic Chemical Vapor Deposition*; Thin Solid Films 533, 66 (2013).
[6] M. Longo, T. Stoycheva, R. Fallica, C. Wiemer, L. Lazzarini, E. Rotunno, *Au-Catalyzed synthesis and characterization of phase change Ge-doped Sb-Te nanowires by MOCVD*; Journal of Crystal Growth 370, 323 (2013).
[5] R. Fallica, F. Volpe, M. Longo, C. Wiemer, O. Salicio, A. Abrutis, *Electronic properties of crystalline $Ge_{1-x}Sb_xTe_y$ thin films*; Applied Physics Letters 101, 102105 (2012).
[4] A. Vellei, R. Fallica, D. Sangalli, A. Lamperti, *Spectroscopic Ellipsometry model for optical constant of NiSi formed on Silicon-On-Insulator substrates*; Journal of Applied Physics 111, 093501 (2012).
[3] M. Longo, R. Fallica, C. Wiemer, O. Salicio, M. Fanciulli, E. Rotunno, L. Lazzarini, *Metal Organic Chemical Vapor Deposition of Phase Change $Ge_1Sb_2Te_4$ Nanowires*; Nano Letters 12, 1509 (2012).
[2] R. Fallica, J.-L. Battaglia, S. Cocco, C. Monguzzi, A. Teren, C. Wiemer, E. Varesi, R. Cecchini, A. Gotti, and M. Fanciulli, *Thermal and Electrical Characterization of Materials for Phase-Change Memory Cells*; J. Chem. Eng. 54, 1698 (2009).
[1] M. Longo, O. Salicio, C. Wiemer, R. Fallica, A. Molle, M. Fanciulli, C. Giesen, B. Seitzinger, P.K. Baumann, M. Heuken, S. Rushworth, *Growth study of $Ge_xSb_yTe_z$ deposited by MOCVD under nitrogen for non-volatile memory applications*; Journal of Crystal Growth 310, 5053 (2008).

Conferences

[C30] SPIE Advance Lithography and Patterning 2024.
[C29] SPIE Photomask and EUV 2023.
[C28] SPIE Advanced Lithography and Patterning EUV, 2023.
[C27] SPIE Photomask and EUV, 2022.
[C26] MNE2022, Leuven, Belgium
[C25] S.-H. Liu, R. Fallica, Z. Dardani, N. Zuurbier, P. Dhagat, E. Wang, *Limitation of EUV single exposure on DRAM applications: learning and challenges*; poster presentation 01, ASML Technology Conference, June 15, 2022.
[C22-C24] SPIE AL 2022.
[C21] R. Fallica et al., *Evolution of Secondary Electrons Emission During EUV Exposure in Photoresists*; oral presentation A-44, 38th International Conference of Photopolymer Science and Technology, June 15-16, 2021 (online).
[C20] R. Fallica et al., *The hidden tail of low energy electrons in EUV lithography*; oral presentation #10960-8, SPIE Advanced Lithography 2019, Feb 25-28, San Jose (USA).
[C19] R. Fallica, I. Mochi and Y. Ekinci, *Experimental estimation of lithographically relevant secondary electron blur*; poster presentation #10, EUVL

Workshop, June 12-15, 2017, Berkeley (USA).
[C18] R. Fallica, D. Kazazis, R. Kirchner, I. Mochi, H. Schift, A. Voigt and Y. Ekinci, *Evaluation and comparison of ZEP520A and mrPosEBR resists by electron beam and extreme ultraviolet lithography*; EIPBN conference, May 30-June 2, 2017, Orlando (USA), poster presentation P22-01.
[C17] R. Fallica, B. Watts, L. Brigo, G. Della Giustina, G. Brusatin, Y. Ekinci, *Chemical changes in hybrid photoresists before and after exposure by in situ NEXAFS*, SPIE Advanced Lithography 2017, San Jose (USA), poster presentation #10146-10.
[C16] R. Fallica, J. Haitjema, L. Wu, S. Castellanos-Ortega, F. Brouwer, Y. Ekinci, *Absorption and exposure kinetics of photoresists at EUV*, SPIE Advanced Lithography 2017, San Jose (USA), oral presentation #10143-6.
[C15] R. Fallica, R. Kirchner, H. Schift, and Y. Ekinci, *High resolution greyscale lithography by EUV interference lithography*; Micro and Nano Engineering Conference, Vienna (A), Sept 21 2016, oral presentation.
[C14] R. Fallica, R. Kirchner, D. Mally, and Y. Ekinci, *A comparative study of resists and lithographic tools using Lumped Parameter Model*; Electron Ion Photon Beam Technology and Nanofabrication 2015, Pittsburgh (USA), June 1st, 2016, oral presentation [1B2].
[C13] R. Fallica, M. Vockenhuber, J. K. Stowers, A. Grenville, Y. Ekinci, *Measurement of dynamic absorption coefficients of CAR and non-CAR resists at EUV*, oral presentation [9776-39], SPIE Advanced Lithography 2016, San Jose (USA).
[C12] R. Fallica, M. Vockenhuber, Y. Ekinci, *Comparative study of line roughness metrics of chemically amplified and inorganic resists for EUV*, oral presentation [9779-18] SPIE Advanced Lithography 2016, San Jose (USA).
[C11] R. Fallica, J. K. Stowers, M. Vockenhuber, Y. Ekinci, *Absorption coefficient and Dill parameters of CAR and non-CAR resists at EUV*; International Symposium on EUV Lithography 2015, Maastricht (NL), Oct 4-7 2015, poster presentation P-RE-06.
[C10] R. Fallica, T. Stoycheva, C. Wiemer, and M. Longo, *Electrical performances of In-based Phase Change Memory*; MRS2013, San Francisco (USA), April 1-5 2013, oral presentation EE14.03.
[C9] M. Longo, T Stoycheva, R. Fallica, C. Wiemer, L. Lazzarini, E. Rotunno, *Sb_2Te_3 and Ge-doped Sb_2Te_3 nanowires for Phase Change Memory applications*; MRS2013, San Francisco (USA), April 1-5, 2013, poster presentation EE5.12.
[C8] R. Fallica, C. Wiemer, T. Stoycheva, M. Longo, H. T. Nguyen, and J-L. Battaglia, *Thermal properties of In-Sb-Te films and interfaces for phase change memory devices*; MAM2013, Leuven (B), March 10-13, 2013, poster presentation P3-03.
[C7] R. Fallica, T. Stoycheva, C. Wiemer, F. Volpe, M. Longo, *Growth and characterization of In-Sb-Te thin films*; E\PCOS2012, Tampere (FIN), Jul. 8-10, 2012, poster PC-17.
[C6] R. Fallica, F. Volpe, M. Longo, C. Wiemer, O. Salicio, A. Abrutis, M. Fanciulli, *Conduction mechanisms in crystalline chalcogenides*; E-MRS2012, Strasbourg (FR), May 13-18, 2012, oral presentation L10.3.
[C5] R. Fallica, M. Longo, C. Wiemer, O. Salicio, M. Fanciulli, L. Lazzarini, E. Rotunno, *Electrical characterization of MOCVD-grown chalcogenide nanowires for phase change memory applications*; E\PCOS2011, Zürich (CH), Sept. 4-6, 2011, poster presentation P13.
[C4] R. Fallica, M. Longo, C. Wiemer, O. Salicio, M. Fanciulli, L. Lazzarini, E. Rotunno, *Electrical characterization of MOCVD-grown chalcogenide nanowires for phase change memory applications*; MRS2011, San Francisco (USA), Apr. 24-28, 2011, oral presentation R5.8.
[C3] R. Fallica, E. Varesi, L. Fumagalli, S. Grasso, D. Erbetta, S. Spadoni, M. Longo, C. Wiemer, M. Fanciulli, *Thermal and electrical characterization of N-doped GeTe*; E\PCOS2010, Milano (I), Sep. 5-7, 2010, poster presentation PB8.
[C2] R. Fallica, C. Wiemer, M. Longo, A. Abrutis, V. Plausinaitiene, E. Varesi, A. Gotti, K. Leitner, M. Fanciulli, R. Bez, *Mobility and carrier density characterization of crystalline GeTe*; ANC-4, Constanta (RO), Jun. 29-Jul. 3, 2009, poster presentation P.31.
[C1] R. Fallica, J.-L. Battaglia, C. Wiemer, E. Varesi, S. Cocco, M. Fanciulli, *Thermal and electrical characterization of materials for PCM cell*; ECTP 2008, Pau (F), 1-4 Sep. 2008, oral presentation.

Conference Proceedings

[CP19] A. Tiwari et al., *The interface study of photoresist/underlayer using hybrid x-ray reflectivity and x-ray standing wave approach*, Proc. of SPIE Vol. 12955, 1295505 (2024).
[CP18] K. M. Dorney et al., *Actinic Inspection of the EUV Optical Parameters of Lithographic Materials with Lab-Based Radiometry and Reflectometry*, Proc. SPIE 1249407 (2023).
[CP17] M. Gupta et al., *Scaled-down deposited underlayers for EUV lithography*, Proc. SPIE 124980R (2023).
[CP16] J. Lee et al., *Patterning assessment using 0.33NA EUV single mask for next generation DRAM manufacturing*, Proc. SPIE 124950S, (2023).
[CP15] K. Sah et al., *Single mask solution to pattern BLP and SNLP using 0.33NA EUV for next generation dram manufacturing*, Proc. SPIE 122920W, (2022).
[CP14] Sayantan Das et al., *EUV based multi-patterning schemes for advanced DRAM nodes*, Proc. SPIE 12055, 1205503 (2022).
[CP13] D. De Simone et al., *A lithographic and etching study on EUV contact hole patterning for stochastic process mitigation towards advanced device scaling*, Proc SPIE AL 2022
[CP12] G. Rispens et al., *Extending EUV lithography for DRAM applications*, Proc. SPIE 11323U (2020).
[CP11] D. De Simone, R. Blanc, J. Van de Kerkhove, A.-H. Tamaddon, R. Fallica, L. Van Look, N. Rassoul, F. Lazzarino, N. Vandenbroeck, P. Vanelderen, G. Lorusso, F. Van Roey, A.-L. Charley, G. Vandenberghe, K. Ronse, K. Lee, J. Lee, S. Park, C.-M. Lim, and C.-H. Park, *Staggered pillar patterning using 0.33NA EUV lithography*, Proc. SPIE 10957, 109570T (2019).
[CP10] D. De Simone, R. Blanc, J. Van de Kerkhove, A.-H. Tamaddon, R. Fallica, L. Van Look, N. Rassoul, F. Lazzarino, N. Vandenbroeck, P. Vanelderen, G. Lorusso, F. Van Roey, A.-L. Charley, G. Vandenberghe, K. Ronse, K. Lee, J. Lee, S. Park, C.-M. Lim, and C.-H. Park, *Staggered pillar patterning using 0.33NA EUV lithography*, Proc. SPIE 10957, 109570T (2019).
[CP9] R. Fallica, B. Watts, L. Brigo, G. Della Giustina, G. Brusatin, Y. Ekinci, *Chemical changes in hybrid photoresists before and after exposure by in situ NEXAFS*, Proc. SPIE 10146, 101461F (2017).
[CP8] R. Fallica, J. Haitjema, L. Wu, S. Castellanos, F. Brouwer, Y. Ekinci, *Absorption coefficient and exposure kinetics of photoresists at EUV*; Proc. SPIE 10143, 101430A (2017).
[CP7] E. Buitrago, M. Meeuwissen, O. Yildirim, R. Custers, R. Hoefnagels, G. Rispens, M. Vockenhuber, I. Mochi, R. Fallica, Z. Tasdemir, and Y. Ekinci, *State-of-the-art EUV materials and processes for the 7nm node and beyond*; Proc. SPIE 10143, 101430T (2017).
[CP6] E. Buitrago, R. Fallica, D. Fan, W. Karim, M. Vockenhuber, J. van Bokhoven, and Y. Ekinci, Proc. SPIE 9926, 99260T (2016).
[CP5] A. Frommhold, A. McClelland, J. Roth, R. Fallica, Y. Ekinci, and A. P. G. Robinson, *Optimization and sensitivity enhancement of high-resolution molecular resist for EUV lithography*; Proc. SPIE 9776, 977614 (2016).
[CP4] R. Fallica, J. K. Stowers, A. Grenville, A. Frommhold, A. P. G. Robinson, and Y. Ekinci, *Dynamic absorption coefficients of CAR and non-CAR resists at EUV*; Proc. SPIE 9776, 977612 (2016).
[CP3] R. Fallica, E. Buitrago, and Y. Ekinci, *Comparative study of line roughness metrics of chemically amplified and inorganic resists for EUV*; Proc. SPIE 9779, 97790K (2016).
[CP2] T. S. Kulmala, M. Vockenhuber, E. Buitrago, R. Fallica, Y. Ekinci, Proc. SPIE. 9422, 942204 (2015).
[CP1] H. T. Nguyen, A. Kusiak, J. L. Battaglia, C. Gaborieau, Y. Anguy, R. Fallica, C. Wiemer, A. Lamperti, and M. Longo, *Thermal Properties of In-Sb-Te Thin Films for Phase Change Memory Application*; Adv. Sci. Tec. 95, 113 (2014).