

HORIZON
2020

Spinoptical nanoantenna-assisted magnetic storage at few nanometers on femtosecond timescale

Resultados

Información del proyecto

FEMTOTERABYTE

Identificador del acuerdo de subvención:
737093

[Sitio web del proyecto](#)

DOI

[10.3030/737093](https://doi.org/10.3030/737093)

Proyecto cerrado

Fecha de la firma de la CE

1 Febrero 2017

Fecha de inicio

1 Marzo 2017

Fecha de finalización

29 Febrero 2020

Financiado con arreglo a

EXCELLENT SCIENCE - Future and Emerging Technologies (FET)

Coste total

€ 3 712 832,50

Aportación de la UE

€ 3 712 832,50

Coordinado por

GOETEBORGS UNIVERSITET



Sweden

CORDIS proporciona enlaces a los documentos públicos y las publicaciones de los proyectos de los programas marco HORIZONTE.

Los enlaces a los documentos y las publicaciones de los proyectos del Séptimo Programa Marco, así como los enlaces a algunos tipos de resultados específicos,

como conjuntos de datos y «software», se obtienen dinámicamente de [OpenAIRE](#) .

Resultado final

Documents, reports (4)

[Technical Action Check Meeting 1](#)

Report from the Technical Meeting Action Check Meeting Agenda and list of presentations delivered during the Technical Meeting Action Check Meeting

[Action Plans](#)

Drafting of the Action Plan Progress monitoring and action plans. Review of the tasks and their progress at M12 and M24 will be consolidated in an action plan for the next year

[Scientific Action Check Meeting 2](#)

Report from Scientific Action Check Meeting 2 Agenda and list of presentations delivered during the 2nd Scientific Action Check Meeting

[Scientific Action Check Meeting 1](#)

Report from the first Scientific Action Check Meeting Agenda and list of presentations delivered during the first Scientific Action Check Meeting

Websites, patent filings, videos etc. (3)

[Public Website](#)

Creation of Femtoterabyte professional project website and logo to serve as the information point of the project.

[Dissemination kit](#)

"The ""dissemination kit"" contains suitable material (e.g. texts and pictures including copyright clearance), which may be used for dissemination of project results. These materials will become available also on the project public website and stay accessible there for a reasonable period i.e. a few years"

[Final press release](#)

Press release summarizing the final project results

Publicaciones

Peer reviewed articles (28)



[Plasmonic layer-selective all-optical switching of magnetization with nanometer resolution](#)

Autores: D. O. Ignatyeva, C. S. Davies, D. A. Sylgacheva, A. Tsukamoto, H. Yoshikawa, P. O. Kapralov, A. Kirilyuk, V. I. Belotelov, A. V. Kimel

Publicado en: Nature Communications, Edición 10/1, 2019, ISSN 2041-1723

Editor: Nature Publishing Group

DOI: 10.1038/s41467-019-12699-0

[Magnetic moment generation in small gold nanoparticles via the plasmonic inverse Faraday effect](#)

Autores: Jérôme Hurst, Peter M. Oppeneer, Giovanni Manfredi, Paul-Antoine Hervieux

Publicado en: Physical Review B, Edición 98/13, 2018, ISSN 2469-9950

Editor: APS

DOI: 10.1103/PhysRevB.98.134439

[Spin-current-mediated rapid magnon localisation and coalescence after ultrafast optical pumping of ferrimagnetic alloys](#)

Autores: E. Iacocca, T.-M. Liu, A. H. Reid, Z. Fu, S. Ruta, P. W. Granitzka, E. Jal, S. Bonetti, A. X. Gray, C. E. Graves, R. Kukreja, Z. Chen, D. J. Higley, T. Chase, L. Le Guyader, K. Hirsch, H. Ohldag, W. F. Schlotter, G. L. Dakovski, G. Coslovich, M. C. Hoffmann, S. Carron, A. Tsukamoto, A. Kirilyuk, A. V. Kimel, Th. Rasing, J. Stöhr, R. F. L. Evans, T. Ostler, R. W. Chantrell, M. A. Hoefer, T. J. Sil

Publicado en: Nature Communications, Edición 10/1, 2019, ISSN 2041-1723

Editor: Nature Publishing Group

DOI: 10.1038/s41467-019-09577-0

[Revealing the Nature of the Ultrafast Magnetic Phase Transition in Ni by Correlating Extreme Ultraviolet Magneto-Optic and Photoemission Spectroscopies](#)

Autores: Wenjing You, Phoebe Tengdin, Cong Chen, Xun Shi, Dmitriy Zusin, Yingchao Zhang, Christian Gentry, Adam Blonsky, Mark Keller, Peter M. Oppeneer, Henry Kapteyn, Zhensheng Tao, Margaret Murnane

Publicado en: Physical Review Letters, Edición 121/7, 2018, ISSN 0031-9007

Editor: American Physical Society

DOI: 10.1103/PhysRevLett.121.077204

[Transport theory for femtosecond laser-induced spin-transfer torques](#)

Autores: Pavel Baláž, Martin Žonda, Karel Carva, Pablo Maldonado, Peter M Oppeneer

Publicado en: Journal of Physics: Condensed Matter, Edición 30/11, 2018, Página(s) 115801, ISSN 0953-8984

Editor: Institute of Physics Publishing

DOI: 10.1088/1361-648X/aaad95

[Unified theory of magnetization dynamics with relativistic and nonrelativistic spin torques](#) 

Autores: Ritwik Mondal, Marco Berritta, Peter M. Oppeneer

Publicado en: Physical Review B, Edición 98/21, 2018, ISSN 2469-9950

Editor: APS

DOI: 10.1103/PhysRevB.98.214429

[Thickness dependent enhancement of the polar Kerr rotation in Co magnetoplasmonic nanostructures](#) 

Autores: Richard M. Rowan-Robinson, Emil Melander, Ioan-Augustin Chioar, Blanca Caballero, Antonio García-Martín, Evangelos Th. Papaioannou, Vassilios Kapaklis

Publicado en: AIP Advances, Edición 9/2, 2019, Página(s) 025317, ISSN 2158-3226

Editor: American Institute of Physics Inc.

DOI: 10.1063/1.5079713

[A multiscale model of the effect of Ir thickness on the static and dynamic properties of Fe/Ir/Fe films](#) 

Autores: Ramón Cuadrado, László Oroszlány, László Szunyogh, Gino Hrkac, Roy W. Chantrell, Thomas A. Ostler

Publicado en: Scientific Reports, Edición 8/1, 2018, ISSN 2045-2322

Editor: Nature Publishing Group

DOI: 10.1038/s41598-018-21934-5

[Beyond a phenomenological description of magnetostriction](#) 

Autores: A. H. Reid, X. Shen, P. Maldonado, T. Chase, E. Jal, P. W. Granitzka, K. Carva, R. K. Li, J. Li, L. Wu, T. Vecchione, T. Liu, Z. Chen, D. J. Higley, N. Hartmann, R. Coffee, J. Wu, G. L. Dakovski, W. F. Schlotter, H. Ohldag, Y. K. Takahashi, V. Mehta, O. Hellwig, A. Fry, Y. Zhu, J. Cao, E. E. Fullerton, J. Stöhr, P. M. Oppeneer, X. J. Wang, H. A. Dürr

Publicado en: Nature Communications, Edición 9/1, 2018, ISSN 2041-1723

Editor: Nature Publishing Group

DOI: 10.1038/s41467-017-02730-7

[Mössbauer spectroscopy of a monolayer of single molecule magnets](#) 

Autores: Alberto Cini, Matteo Mannini, Federico Totti, Maria Fittipaldi, Gabriele Spina, Aleksandr Chumakov, Rudolf Rüffer, Andrea Cornia, Roberta Sessoli

Publicado en: Nature Communications, Edición 9/1, 2018, ISSN 2041-1723

Editor: Nature Publishing Group

DOI: 10.1038/s41467-018-02840-w

[The disclosure of mesoscale behaviour of a 3d-SMM monolayer on Au\(111\) through a multilevel approach](#)

Autores: Guglielmo Fernandez Garcia, Alessandro Lunghi, Federico Totti, Roberta Sessoli

Publicado en: Nanoscale, Edición 10/8, 2018, Página(s) 4096-4104, ISSN 2040-3364

Editor: Royal Society of Chemistry

DOI: 10.1039/c7nr06320b

[Critical behavior within 20 fs drives the out-of-equilibrium laser-induced magnetic phase transition in nickel](#)

Autores: Phoebe Tengdin, Wenjing You, Cong Chen, Xun Shi, Dmitriy Zusin, Yingchao Zhang, Christian Gentry, Adam Blonsky, Mark Keller, Peter M. Oppeneer, Henry C. Kapteyn, Zhensheng Tao, Margaret M. Murnane

Publicado en: Science Advances, Edición 4/3, 2018, Página(s) eaap9744, ISSN 2375-2548

Editor: AAAS

DOI: 10.1126/sciadv.aap9744

[The 2017 Magnetism Roadmap](#)

Autores: D Sander, S O Valenzuela, D Makarov, C H Marrows, E E Fullerton, P Fischer, J McCord, P Vavassori, S Mangin, P Pirro, B Hillebrands, A D Kent, T Jungwirth, O Gutfleisch, C G Kim, A Berger

Publicado en: Journal of Physics D: Applied Physics, Edición 50/36, 2017, Página(s) 363001, ISSN 0022-3727

Editor: Institute of Physics Publishing

DOI: 10.1088/1361-6463/aa81a1

[THz-driven demagnetization with perpendicular magnetic anisotropy: towards ultrafast ballistic switching](#)

Autores: Debanjan Polley, Matteo Pancaldi, Matthias Hudl, Paolo Vavassori, Sergei Urazhdin, Stefano Bonetti

Publicado en: Journal of Physics D: Applied Physics, Edición 51/8, 2018, Página(s) 084001, ISSN 0022-3727

Editor: Institute of Physics Publishing

DOI: 10.1088/1361-6463/aaa863

[Relativistic theory of magnetic inertia in ultrafast spin dynamics](#)

Autores: Ritwik Mondal, Marco Berritta, Ashis K. Nandy, Peter M. Oppeneer

Publicado en: Physical Review B, Edición 96/2, 2017, ISSN 2469-9950

Editor: APS

DOI: 10.1103/physrevb.96.024425

[Metal N,N-dialkylcarbamates as easily available catalytic precursors for the carbon dioxide/propylene oxide coupling under ambient conditions](#) 

Autores: Giulio Bresciani, Fabio Marchetti, Giorgia Rizzi, Alessio Gabbani, Francesco Pineider, Guido Pampaloni

Publicado en: Journal of CO2 Utilization, Edición 28, 2018, Página(s) 168-173, ISSN 2212-9820

Editor: Elsevier BV

DOI: 10.1016/j.jcou.2018.09.023

[Magnetic properties of Co-doped Nb clusters](#) 

Autores: A. Diaz-Bachs, L. Peters, R. Logemann, V. Chernyy, J. M. Bakker, M. I. Katsnelson, A. Kirilyuk

Publicado en: Physical Review B, Edición 97/13, 2018, ISSN 2469-9950

Editor: APS

DOI: 10.1103/physrevb.97.134427

[Generalisation of Gilbert damping and magnetic inertia parameter as a series of higher-order relativistic terms](#) 

Autores: Ritwik Mondal, Marco Berritta, Peter M Oppeneer

Publicado en: Journal of Physics: Condensed Matter, Edición 30/26, 2018, Página(s) 265801, ISSN 0953-8984

Editor: Institute of Physics Publishing

DOI: 10.1088/1361-648x/aac5a2

[Anti-reflection coating design for metallic terahertz meta-materials](#) 

Autores: Matteo Pancaldi, Ryan Freeman, Matthias Hudl, Matthias C. Hoffmann, Sergei Urazhdin, Paolo Vavassori, Stefano Bonetti

Publicado en: Optics Express, Edición 26/3, 2018, Página(s) 2917, ISSN 1094-4087

Editor: Optical Society of America

DOI: 10.1364/OE.26.002917

[Interaction modifiers in artificial spin ices](#) 

Autores: Erik Östman, Henry Stopfel, Ioan-Augustin Chioar, Unnar B. Arnalds, Aaron Stein, Vassilios Kapaklis, Björgvin Hjörvarsson

Publicado en: Nature Physics, Edición 14/4, 2018, Página(s) 375-379, ISSN 1745-2473

Editor: Nature Publishing Group

DOI: 10.1038/s41567-017-0027-2

[Selective and fast plasmon-assisted photo-heating of nanomagnets](#) 

Autores: Matteo Pancaldi, Naëmi Leo, Paolo Vavassori

Publicado en: Nanoscale, Edición 11/16, 2019, Página(s) 7656-7666, ISSN 2040-3364

Editor: Royal Society of Chemistry

DOI: 10.1039/c9nr01628g

[Perspective: plasmon antennas for nanoscale chiral chemistry](#)

Autores: Esteban Pedrueza-Villalmanzo, Francesco Pineider, Alexandre Dmitriev

Publicado en: Nanophotonics, Edición 9/2, 2020, Página(s) 481-489, ISSN 2192-8614

Editor: De Gruyter

DOI: 10.1515/nanoph-2019-0430

[Enhanced magnetic modulation of light polarization exploiting hybridization with multipolar dark plasmons in magnetoplasmonic nanocavities](#)

Autores: Alberto López-Ortega, Mario Zapata-Herrera, Nicolò Maccaferri, Matteo Pancaldi, Mikel Garcia, Andrey Chuvilin, Paolo Vavassori

Publicado en: Light: Science & Applications, Edición 9/1, 2020, Página(s) 49, ISSN 2047-7538

Editor: Springer Nature Group

DOI: 10.1038/s41377-020-0285-0

[Observation of the nonlinear Wood's anomaly on periodic arrays of nickel nanodimers](#)

Autores: Ngoc-Minh Tran, Ioan-Augustin Chioar, Aaron Stein, Alexandr Alekhin, Vincent Juvé, Gwenaëlle Vaudel, Ilya Razdolski, Vassilios Kapaklis, Vasily Temnov

Publicado en: Physical Review B, Edición 98/24, 2018, ISSN 2469-9950

Editor: American Physical Society

DOI: 10.1103/PhysRevB.98.245425

[Nanoscale magnetophotonics](#)

Autores: Nicolò Maccaferri, Irina Zubritskaya, Ilya Razdolski, Ioan-Augustin Chioar, Vladimir Belotelov, Vassilios Kapaklis, Peter M. Oppeneer, Alexandre Dmitriev

Publicado en: Journal of Applied Physics, Edición 127/8, 2020, Página(s) 080903, ISSN 0021-8979

Editor: American Institute of Physics

DOI: 10.1063/1.5100826

[Tunable magnetoplasmonics in lattices of Ni/SiO₂/Au dimers](#)

Autores: Sara Pourjamal, Mikko Kataja, Nicolò Maccaferri, Paolo Vavassori, Sebastiaan van Dijken

Publicado en: Scientific Reports, Edición 9/1, 2019, ISSN 2045-2322

Editor: Nature Publishing Group

DOI: 10.1038/s41598-019-46058-2

[Collective magnetization dynamics in nanoarrays of thin FePd disks](#) 

Autores: Agne Ciuciulkaite, Erik Östman, Rimantas Brucas, Ankit Kumar, Marc A. Verschuuren, Peter Svedlindh, Björgvin Hjörvarsson, Vassilios Kapaklis

Publicado en: Physical Review B, Edición 99/18, 2019, ISSN 2469-9950

Editor: NA

DOI: 10.1103/PhysRevB.99.184415

[Probing the Radiative Electromagnetic Local Density of States in Nanostructures with a Scanning Tunneling Microscope](#) 

Autores: Shuiyan Cao, Mario Zapata-Herrera, Alfredo Campos, Eric Le Moal, Sylvie Marguet, Gérald Dujardin, Mathieu Kociak, Javier Aizpurua, Andrei G. Borisov, Elizabeth Boer-Duchemin

Publicado en: ACS Photonics, Edición 7/5, 2020, Página(s) 1280-1289, ISSN 2330-4022

Editor: American Chemical Society

DOI: 10.1021/acsphotonics.0c00264

Other (7)

Hypersonic heat-induced flows of magnons induced by femtosecond laser pulses

Autores: Ruta, Sergiu; Fu, Zuwei; Ostler, Thomas; Kimel, Alexey; Chantrell, Roy

Publicado en: 2020

Editor: Cornell Uni

Role of Element-Specific Damping on the Ultrafast, Helicity-Independent All-Optical Switching Dynamics in Amorphous (Gd,Tb)Co Thin Films

Autores: Ceballos, Alejandro; Pattabi, Akshay; El-Ghazaly, Amal; Ruta, Sergiu; Simon, Christian P.; Evans, Richard F. L.; Ostler, Thomas; Chantrell, Roy W.; Kennedy, Ellis; Scott, Mary; Bokor, Jeffrey; Hellman, Frances

Publicado en: 2020

Editor: Cornell Uni

Design of Amorphous Tb_xCo_{100-x} Alloys for All-Optical Magnetization Switching

Autores: Ciuciulkaite, Agne; Mishra, Kshiti; Moro, Marcos V.; Chioar, Ioan-Augustin; Rowan-Robinson, Richard M.; Parchenko, Sergii; Kleibert, Armin; Lindgren, Bengt; Andersson, Gabriella; Davies, Carl; Kimel, Alexey; Berritta, Marco; Oppeneer, Peter M.; Kirilyuk, Andrei; Kapaklis, Vassilios

Publicado en: 2020

Editor: Cornell Uni

[Simultaneous two-color snapshot view on ultrafast charge and spin dynamics in a Fe-Cu-Ni tri-layer](#)



Autores: Rösner, Benedikt; Vodungbo, Boris; Chardonnet, Valentin; Döring, Florian; Guzenko, Vitaliy A.; Hennes, Marcel; Kleibert, Armin; Lebugle, Maxime; Lüning, Jan; Mahne, Nicola; Merhe, Aladine; Naumenko, Denys; Nikolov, Ivaylo P.; Lopez-Quintas, Ignacio; Pedersoli, Emanuele; Ribič, Primož R.; Savchenko, Tatiana; Watts, Benjamin; Zangrando, Marco; Capotondi, Flavio; David, Christian; Jal, Emmanuell

Publicado en: 2020, Edición 2, 2020

Editor: Zenodo

DOI: 10.5281/zenodo.3735722

Spectrally reconfigurable magnetoplasmonic nanoantenna arrays

Autores: Rowan-Robinson, Richard M.; Hurst, Jérôme; Ciuciulkaite, Agne; Chioar, Ioan-Augustin; Pohlit, Merlin; Zapata, Mario; Vavassori, Paolo; Dmitriev, Alexandre; Oppeneer, Peter M.; Kapaklis, Vassilios

Publicado en: 2020

Editor: Cornell Uni

Nondestructive femtosecond laser lithography of Ni nanocavities by controlled thermo-mechanical spallation at the nanoscale

Autores: Temnov, V. V.; Alekhin, A.; Samokhvalov, A.; Ivanov, D. S.; Vavassori, P.; Veiko, V. P.

Publicado en: 2020

Editor: Cornell Uni

Single femtosecond laser pulse excitation of individual cobalt nanoparticles

Autores: Savchenko, Tatiana M.; Buzzi, Michele; Howald, Ludovic; Ruta, Sergiu; Vijayakumar, Jaianth; Timm, Martin; Bracher, David; Saha, Susmita; Derlet, Peter M.; Béché, Armand; Verbeeck, Jo; Chantrell, Roy W.; Vaz, C. A. F.; Nolting, Frithjof; Kleibert, Armin

Publicado en: 2020

Editor: Cornell Uni

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