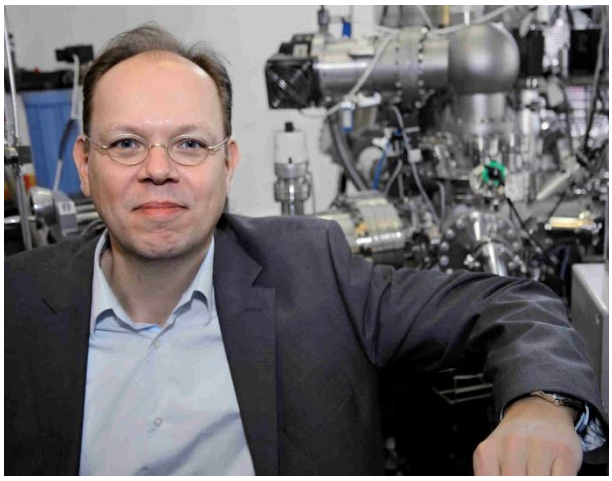
Marcel Di Vece

ORCID ID: 0000-0002-0041-4348

www.divece.net

Researchgate

LinkedIn



Dopo il dottorato in Fisica nel 2003 sullo "Specchio commutabile" presso l'Università di Utrecht, nei Paesi Bassi, ho ottenuto una ricca esperienza post-dottorato internazionale con particolare attenzione alle nanoparticelle. Dopo aver lavorato su vari argomenti come lo stoccaggio dell'idrogeno e il magnetismo delle nanoparticelle, ho iniziato la mia linea di ricerca con le nanoparticelle e la luce dal 2010. La parte applicata del mio lavoro attuale riguarda le nanoparticelle per il fotovoltaico in cui sto usando metallo (plasmonico) e semiconduttori (quantum dot) nanoparticelle per migliorare l'intrappolamento della luce nelle celle solari a film sottile. Oltre a questa ricerca nel nuovo concetto di fotovoltaico, sto anche studiando l'interazione luce-materia da un punto di vista più fondamentale. Recentemente ho ripreso la ricerca finalizzata allo stoccaggio dell'idrogeno nelle nanoparticelle. Per questa ricerca utilizzo una sorgente di cluster di aggregazione di gas dedicata combinata con una sorgente di sputter a film sottile, con la quale è possibile fabbricare quasi tutti i compositi a film sottile di nanoparticelle.

Ultima esperienza lavorativa

2019-present	Associate professor, Department of Physics, Milano University, Italy

Nanoparticelle per il fotovoltaico e lo stoccaggio dell'idrogeno: sto studiando particelle semiconduttrici come blocchi quantistici confinati per celle solari e particelle metalliche plasmoniche e particelle dielettriche Mie per strategie di assorbimento della luce potenziate. Sto studiando lo stoccaggio dell'idrogeno in piccole particelle di metallo come il magnesio.

2016-2019	Tenure Track Associate professor, Department of Physics, Milano University, Italy
2015-2016	Visiting professor, at Laboratorium voor Vaste stoffysica en Magnetisme, Katholieke Universiteit Leuven, Belgium
2010-2015	Assistant professor, Nanophotonics-Physics of Devices, Utrecht University, The Netherlands
2010-2010	Postdoctoral Fellow at Center for Individual Nanoparticle Functionality (CINF), Technical University of Denmark, Denmark

2009-2010 Associate Research Scientist at Chemical Engineering, Yale University, USA, From September 2009 consultant at Argonne National Laboratory, USA

Formazione scolastica

1999-2003 Ph.D. at Physics and Chemistry of Condensed Matter, Utrecht University, Netherlands, "*The metal hydride switchable mirror*"

Tecniche sperimentali

Femto second Confocal Microscopy, Extended X-ray Absorption Fine Structure (EXAFS, ESRF (Grenoble), APS (Argonne)), Electrochemistry, XANES, XRD, GISAXS, STM, AFM, TEM,SEM, Vacuum techniques, Magnetron sputtering, Pulsed laser deposition (PLD), Optical absorption spectroscopy, Laser spectroscopy, TPR, Gas chromatography, Spectral response, solar simulator, FDTD simulations.

Insegnamento in corso presso UNIMI

Struttura della Materia 1 (CORSO A) Esercitazioni

Laboratorio di ottica, elettronica e fisica moderna

Fisica dello stato solido su nanoscala

Pubblicazioni

Google Scholar h-index = 22
Web of Science h-index = 21

Photo stimulated hydrogen desorption from magnesium nanoparticles
Christopher A. Owen, Alessandro Podestà, Cristina Lenardi, Shima Kadkhodazadeh and Marcel Di Vece , International Journal of Hydrogen Energy, 47, 81, 34594-34604 (2022)

Disentangling the Ultrafast Nonlinear Optical Behavior of Plasmonic Resonances Near the Interband Transition
Andrea Schirato, Mychel G. Silva, Danielle C. Teles-Ferreira, Cristian Manzoni, Ana Maria de Paula, Giulio Cerullo, Giuseppe Della Valle, and Marcel Di Vece, Advanced Photonics Research 2200081 (2022)

2022 Roadmap on 3D Printing for Energy
Albert Tarancon et al. J. Phys. Energy 2022

Inserting hydrogen into germanium quantum dots.

Elisa Vitiello, Courtney H. Schreiber, Emma X. Riccardi, Jack G. Nedell, Edoardo Bellincioni, Jacopo Parravicini, Simona O. Binetti, Alessandro Podesta, Cristina Lenardi, Fabio Pezzoli, Marcel Di Vece, Journal of Physical Chemistry C 125, 44, 24640–24647 (2021)

The importance of Mie resonances in ultra-black dragonfish skin pigment particles.
Ishaan Lohia, Samuel Ahearn, Joseph Franjieh and Marcel Di Vece, Journal of Nanoparticle Research, 23, 141 (2021)

Octahedral Growth of PtPd Nanocrystals
Diana Nelli, Cesare Roncaglia, Samuel Ahearn, Marcel Di Vece, Riccardo Ferrando and Chloé Minnai, Catalysts, 11 (6), 718 (2021)

Virtual designer metals for enhancement of plasmonic nanoparticles which improve the light absorption in silicon
Jack G. Nedell and Marcel Di Vece, accepted by Advanced Optical Materials 2001011, (2020)

Quantum Confinement in the Spectral Response of n-Doped Germanium Quantum Dots Embedded in an Amorphous Si Layer for Quantum Dot-Based Solar Cells.
Jacopo Parravicini, Francesco Di Trapani, Michael D. Nelson, Zachary T. Rex, Ryan D. Beiter, Tiziano Catelani, Maurizio F. Acciarri, Alessandro Podesta, Cristina Lenardi, Simona O. Binetti, Marcel Di Vece, ACS Applied Nano Materials, 3, 3, 2813–2821 (2020)

Nanoscale induced formation of silicide around gold nanoparticles encapsulated in a-Si.
Cristina Lenardi, Justin Mayer, Gabriele Faraone, Jonathan Cardoso, Sarita Marom, Ritika Modi, Alessandro Podesta, Shima Kadkhodazadeh, Marcel Di Vece, Langmuir 36, 4, 939-947 (2020)

The effect of the refractive index profile on the optical response of plasmonic nanostructures inside semiconductors
Zachary T. Rex and Marcel Di Vece, Optical Materials 96, 109314 (2019)

Using a neural network to improve the optical absorption in Halide Perovskite layers containing core-shells silver nanoparticles
Michael D. Nelson and Marcel Di Vece, Nanomaterials, 9, 437 (2019)

Possible deviations from AM1.5 illumination in coherent light simulations on plasmonic nanostructures in Perovskite solar cells
Loïc McKeever and Marcel Di Vece, Solar Energy, 181, 452-455 (2019)

Germanium quantum dot Grätzel type solar cell
Jonathan Cardoso, Sarita Marom, Justin Mayer, Ritika Modi, Alessandro Podestà, Xiaobin Xie, Marijn A. van Huis, and Marcel Di Vece, Phys. Status Solidi A (2018)

Silver nanoparticles from a gas aggregation nanoparticle source for plasmonic efficiency enhancement in a-Si solar cells
Sarita Marom, Monique Dorresteijn, Ritika Modi, Alessandro Podestà and Marcel Di Vece Materials Research Express (2019)

"Planetary" silver nanoparticles originating from a magnetron sputter plasma
Sarita Marom, Michael Plesser, Ritika Modi, Nicola Manini, Marcel Di Vece, J. Phys. D: Appl. Phys. (2018)

Quantifying the plasmonic orthogonalisation of light for Si, a-Si, and Perovskite solar cells
Marcel Di Vece, Journal of Optics, 20, 085901 (2018)

Using Nanoparticles as a Bottom-up Approach to Increase Solar Cell Efficiency
Marcel Di Vece, KONA Powder and Particle Journal (2019)

Increasing the optical absorption in a-Si thin films by embedding gold nanoparticles
Gabriele Faraone, Ritika Modi, Sarita Marom, Alessandro Podestà and Marcel Di Vece, Optical Materials, 75, 204-210 (2018)

Wavelength Dependent Nonlinear Optical Properties of Ag Nanoparticles Dispersed in a Glass Host
Piero Ferrari, Sneha Upadhyay, Mikhail V. Shestakov, Jan Vanbuel, Bert De Roo, Yinghuan Kuang, Marcel Di Vece Victor Moshchalkov, Jean-Pierre Locquet, Peter Lievens, Ewald Janssens, accepted in J. Phys. Chem. C. (2017)

Very Long Plasmon Oscillation Lifetimes in the Gap Between Two Gold Particles
Marcel Di Vece, Plasmonics, 13, 1367-1371 (2018)

Mechanical-optical-electro modulation by stretching a polymer-metal nanocomposite
Chloe Minnai, Marcel Di Vece, Paolo Milani, accepted in Nanotechnology (2017)

Improving optical absorption in a-Si thin films with TiO2 Mie scatterers
Giorgos Giannakoudakis and Marcel Di Vece, Eur. Phys. J. D, 71, 101 (2017)

Concepts for external light trapping and its utilization in colored and image displaying photovoltaic modules
Lourens van Dijk, Jorik van de Groep, Leon W. Veldhuizen, Marcel Di Vece, Ruud E.I. Schropp, Prog. Photovolt: Res. Appl., doi: 10.1002/pip.2863 (2017)

Exploration of external light trapping for photovoltaic modules
Lourens van Dijk, Jorik van de Groep, Marcel Di Vece, Ruud Schropp, Optics Express, 24, A1158 (2016)

Plasmonic Scattering Back Reflector for Light Trapping in Flat Nano-Crystalline Silicon Solar Cells
Lourens van Dijk, Jorik van de Groep, Leon W. Veldhuizen, Marcel Di Vece, Albert Polman, Ruud E.I. Schropp, ACS Photonics (2016)

Shifting the Aluminum nanoparticle plasmon resonance to the visible with SiN and a-Si thin films
Thomas van der Vliet and Marcel Di Vece, Thin Solid Films, 603, 404-407 (2016)

Charging gold nanoparticles in ZnO by electric fields
M. Obradovic, M. Di Vece, D. Grandjean, K. Houben, P. Lievens, J. Phys.: Condens. Matter 28, 035303 (2016)

Luminescent tracks of high-energy photoemitted electrons accelerated by plasmonic fields
Marcel Di Vece, Giorgos Giannakoudakis, Astrid Bjørkøy, and Wingjohn Tang, Nanophotonics 4, 511–519 (2015)

Multipole plasmons and their disappearance in few-nanometre silver nanoparticles
Søren Raza, Shima Kadkhodazadeh, Thomas Christensen, Marcel Di Vece, Martijn Wubs, N. Asger Mortensen, Nicolas Stenger, **Nature Communications** 6, 8788 doi:10.1038/ncomms9788 (2015)

Understanding the Thermal Stability of Silver Nanoparticles Embedded in a-Si
Anna L. Gould, Shima Kadkhodazadeh, Jakob B. Wagner, C. Richard A. Catlow, Andrew J. Logsdail, and Marcel Di Vece, J. Phys. Chem. C.,119, 41,23767–23773 (2015)

3D-Printed External Light Trap for Solar Cells
Lourens van Dijk, Ulrich W. Paetzold, Gerhard A. Blab, Ruud E.I. Schropp, and Marcel Di Vece, Progress in Photovoltaics, DOI: 10.1002/pip.2702 (2015)

Optical response of silver nanoneedles on a mirror
Arjan Keeman, E. Stefan Kooij, Dick van Dam, Ruud E. I. Schropp, Marcel Di Vece Plasmonics, 10, 5, 1089-1096 (2015)

3D-printed concentrator arrays for external light trapping on thin film solar cells
Lourens van Dijk, E.A. Pepijn Marcus, A. Jolt Oostra, Ruud E.I. Schropp, Marcel Di Vece, Solar Energy Materials & Solar Cells 139, 19–26 (2015)

Formation and Photoluminescence of “Cauliflower” Silicon Nanoparticles
Wingjohn Tang, Joren J. Eilers, Marijn A. van Huis, Da Wang, Ruud E. I. Schropp, and Marcel Di Vece, J. Phys. Chem. C, 119, 20, 11042–11047 (2015)

Photoluminescence as a probe of the electrical charge dependence of gold nanoparticles
M. S. Obradovic, M. Di Vece, I. Asselberghs, D. Grandjean, K. Clays, P. Lievens, J. Nanosci. Nanotechnol. 15, 9766-9771 (2015)

Hydrogen-induced Ostwald ripening of cobalt nanoparticles on carbon nanotubes
Marcel Di Vece, Codruta Zoican-Loebick, Lisa D. Pfefferle, Journal of Nanoparticle Research, 16, 2234 (2014)

Elongated nanostructures for radial junction solar cells
Y Kuang, M Di Vece, J K. Rath, L van Dijk, and R.E.I. Schropp, Reports on Progress in Physics 106502 (2013)

Switching CdSe quantum dot luminescence with a-Si:H
M Di Vece, S N F van Duren, D J van den Heuvel, D Mitoraj,
Y Kuang, H C Gerritsen and R E I Schropp, Nanotechnology 24, 315202 (2013)

Plasmonic nano-antenna a-Si:H solar cell
M. Di Vece, Y. Kuang, S. van Duren, J.M. Charry, L. van Dijk and R.E.I. Schropp,
Optics Express, 20, 25, 27327 (2012)

Fabrication and characterization of nanorod solar cells with an ultrathin a-Si:H absorber layer
Y. Kuang, K.H.M. van der Werf, Z. S. Houweling, M. Di Vece, and R.E.I. Schropp, J. Non-Cryst. Solids, 358, 17, 2209 (2012)

Oxidative dehydrogenation of cyclohexene on size selected subnanometer cobalt clusters: improved catalytic performance via evolution of cluster-assembled nanostructures
S. Lee, M. Di Vece, B. Lee, S Seifert, R.E. Winans and S. Vajda, Phys Chem Chem Phys, DOI: 10.1039/C2CP40162B (2012)

Support-dependent Performance of Size-selected Subnanometer Cobalt Cluster-based Catalysts in the Dehydrogenation of Cyclohexene
S. Lee, M. Di Vece, B. Lee et al, ChemCatChem, 4,10, 1632 (2012)

Oxidative Dehydrogenation of Cyclohexane on Cobalt Oxide (Co3O4) Nanoparticles: The Effect of Particle Size on Activity and Selectivity
E.C. Tyo, C. Yin, M. Di Vece,et al. ACS Catalysis, 2, 11, 2409 (2012)

Quenching of TiO2 photo catalysis by silver nanoparticles
M. Di Vece, A. B. Laursen, L. Bech, C.N. Maden, M. Duchamp, R. V. Mateiu S. Dahl, I. Chorkendorff, J. of Photo. and Photobio. A: Chem. 230, 10 (2012)

Passivation of Co nanoclusters assembled thin films with hydrogen
C.P. Romero, A. Volodin, M. Di Vece, H. Paddubrouskaya, Huan Wang, A. Vantomme, C. Van Haesendonck and P. Lievens, Thin Solid Films, 520, 17, 5584 (2012)

Combined TPRx, in situ GISAXS and GIXAS studies of model semiconductor-supported platinum nanocatalysts in the hydrogenation of ethylene
S A. Wyrzgol, S. Schäfer, S. Lee, B. Lee, M. Di Vece, X. Li, S. Seifert, R. E. Winans, J. A. Lercher, M. Stutzmann, S. Vajda, Phys Chem Chem Phys, 12, 5585 (2010)

SiC: a photocathode for water splitting and hydrogen storage
D.H. van Dorp, N. Hijnen, M. Di Vece and J.J. Kelly, Angew. Chem. Int. Ed., 48, 6085 (2009)

Compositional changes of Pd-Au bimetallic nanoclusters upon hydrogen-exposure
M. Di Vece, S. Bals, J. Verbeeck, P. Lievens and G. Van Tendeloo, Phys. Rev. B, 80, 125420 (2009)

Three dimensional magnetization exchange coupling of Fe and V mixed nanoclusters affected by hydrogen
V. K. Valev, M. Di Vece*, M. Van Bael, D. Grandjean, S. Decoster, A. Vantomme, T. Verbiest, and P. Lievens, J. Appl. Phys. 105, 114907 (2009)

Controlling the photoluminescence of CdSe/ZnS quantum dots with a magnetic field
M. Di Vece, B. Kolaric, K. Baert, G. Schweitzer, R. A. L. Vallée, P. Lievens, K. Clays, Nanotechnology, 20, 135203 (2009)

Hydrogen induced Ostwald ripening
M. Di Vece, D. Grandjean, M.J. Van Bael, C.P. Romero, X. Wang, S. Decoster, A. Vantomme and P. Lievens, ESRF Highlights 2008 (and cover)
http://www.esrf.eu/UsersAndScience/Publications/Highlights/2008
ESRF Spotlight (with movie)

Inhomogeneous phase transition upon hydrogenation of nanocluster Pd film
M. Di Vece, J.J. Kelly and P. Lievens, ChemPhysChem, 10, 3, 512 (2009)

Angular dependence of fluorescence emissionfrom quantum dotsinside a photonic crystal
K. Baert, B. Kolaric, W. Libaers, R.A.L. Vallee, M. Di Vece, P. Lievens and K. Clays, Res. Lett. Nano Tech., 974072 (2008)

Weighing Supported Nanoparticles: Size-Selected Clusters as Mass Standards in Nanometrology
N.P. Young, Z.Y. Li, Y. Chen, S. Palomba, M. Di Vece, R.E. Palmer, Phys. Rev. Lett., 101, 246104 (2008)

Hydrogen induced Ostwald ripening at room temperature in a Pd nanocluster assembled film
M. Di Vece, D. Grandjean, M.J. Van Bael, C.P. Romero, X. Wang, S. Decoster, A. Vantomme and P. Lievens, Phys. Rev. Lett. 100, 236105 (2008)

Three dimensional atomic-scale structure of size-selected gold nanoclusters
Z.Y. Li, N.P. Young, M. Di Vece, S. Palomba, R.E. Palmer, A. Bleloch, B.C. Curley, R.L. Johnston, J. Jiang, J. Yuan, **Nature**, 451, 46 (2008)

Combining Theory and Experiment to Characterize the Atomic Structures of Surface-Deposited Au309 Clusters
Benjamin C. Curley and Roy L. Johnston, Neil P. Young, Z. Y. Li, Marcel Di Vece, Richard E. Palmer, Andrew L. Bleloch, J. Phys. Chem., 111, 17846 (2007)

Development of magnetic materials for photonic applications
Kasper Baert, Wim Libaers, Branko Kolaric, Renaud A. L. Vallée, Mark Van der Auweraer, Didier Grandjean, Marcel Di Vece, Peter Lievens, Koen Clays, Journal of Nonlinear Optical Physics & Materials, 16, 289 (2007)

Co-deposition of atomic clusters of different size and composition
M. Di Vece, N. Young, Z. Y. Li, Y. Chen and R. E. Palmer, Small, 2, 1270 (2006)

Pinning of size-selected Pd nanoclusters on graphite
S. Gibilisco, M. Di Vece, S. Palomba, G. Faraci and R.E. Palmer, J. Chem Phys., 125, 084704 (2006)

Modelling the pinning of Au and Ni clusters on graphite
R. Smith, C. Nock, S.D. Kenny, J.J. Belbruno, M. Di Vece, S. Palomba, R.E. Palmer, Phys. Rev. B., 73, 125429 (2006)

Pinning of size-selected gold and nickel nanoclusters on graphite
M. Di Vece, S. Palomba, and R.E. Palmer, Phys. Rev. B, 72, 073407 (2005)

Structure of the Mg2Ni switchable mirror: an EXAFS investigation
M. Di Vece, A. M. J. van der Eerden, D. Grandjean, R. J. Westerwaal, W. Lohstroh, S.G. Nikitenko, J. J. Kelly, and D.C. Koningsberger, Mat. Chem. Phys., 91, 1 (2005)

Electrochemical study of hydrogen diffusion in a vanadium thin film
M. Di Vece, A. Remhof and J.J. Kelly, Electrochem. Com., 6, 17 (2004)

Synthesis and characterization of Pd nano-pillar arrays in the metal hydride switchable mirror
M. Di Vece and J.J. Kelly, Mat. Res. Soc. Symp. Proc., 776, Q11.7.1 (2003)

Electrochemical hydrogen intercalation kinetics in gadolinium switchable mirrors
M. Di Vece, I. Swart and J.J. Kelly, J. Appl. Phys.,94, 4659 (2003)

X-ray absorption fine structure study of the structural and electronic properties of the GdMg hydride switchable mirror
M. Di Vece, A.M.J. van der Eerden, J.A. van Bokhoven, S. Lemaux, J.J. Kelly and D.C. Koningsberger, Phys. Rev. B, 67, 035430 (2003)

Electrochemical study of hydrogen diffusion in yttrium hydride switchable mirrors
M. Di Vece and J.J. Kelly, J. Alloy. Comp., 356-357, 156-159 (2003)

Optical switching properties from isotherms of Gd and GdMg hydride mirrors
M. Di Vece, S. J. M. Zevenhuizen, and J. J. Kelly, Appl. Phys. Lett., 81, 1213 (2002)

Tunable reflectance of Mg–Ni–H films
J. Isidorsson, I.A.M.E. Giebels, R. Griessen and M. Di Vece, Appl. Phys. Lett., 80, 2305 (2002)

Thermochromic effect in YH3-d and Mg0.1Y0.9H2.9-d
I.A.M.E. Giebels, S. J. van der Molen, R. Griessen, and M. Di Vece, Appl. Phys. Lett., 80, 1343 (2002)

A Photoelectrochemical Study of the GdMg Hydride Switchable Mirror
M. Di Vece, P. van der Sluis, A.-M. Janner and J.J. Kelly, J. Electrochem. Soc. 148, G576-G580 (2001)

Capitoli del libro:

"Elongated nanostructured solar cells with a plasmonic core", Review in Plasmonics, Ed. Chris Geddes, Springer 2015

"Deflection and Mass Filtering", Gas-Phase Synthesis of Nanoparticles, First Edition. Edited by Yves Huttel. Wiley-VCH Verlag GmbH & Co. KGaA. (2017)

"Cluster-Assembled Materials: From Fabrication to Function"
F. Borghi, A. Podestà, M. Di Vece,C. Piazzoni, P. Milani.
Wandelt, K., (Ed.) Encyclopedia of Interfacial Chemistry: Surface Science and Electrochemistry, vol. 3, pp 417–427 (2018).

"Cluster-assembled devices for solar energy conversion"
Marcel Di Vece
Cluster Beam Deposition of Functional Nanomaterials and Devices, vol. 15, ed. P. Milani & M. Sowwan. 2020
Series: Frontiers of Nanoscience