Dr. Oliver Dorn

Curriculum Vitae

Senior Lecturer in Applied Mathematics
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Synopsis

Dr Oliver Dorn is an internationally recognized authority on the application of level set methods to inverse problems. He is currently a Senior Lecturer (Associate Professor) at The University of Manchester. During his career Dr Oliver Dorn has been working on a large variety of important inverse problems including geophysical tomography, reservoir characterization, biomedical imaging, remote sensing and non-destructive evaluation of materials. He has been collaborating with several international and national companies such as Shell, Repsol/YPF, Schlumberger, Rohde und Schwarz, ITS, AWE, DSTL, LLNL, amongst others. Current research projects include large scale electromagnetic inverse problems, through-the-wall radar imaging, history matching and data assimilation, seismic full waveform inversion, gravity/gradiometry imaging, data analysis and machine learning. He has been participating in a large variety of nationally and internationally funded research projects and consortia in the US, Canada, Spain, France, and the UK. He spent several extended invited research stays at international research centres such as MGSS (Stanford University), MSRI (Berkeley), IPAM (Los Angeles), IMA (Minneapolis), BIRS (Banff) and CenSSIS (Boston). He has presented over 150 mostly invited conference presentations worldwide, and has published over 80 peer-reviewed journal and conference papers, book chapters and review papers. Several of his publications have been selected by the highly ranked journal 'Inverse Problems' to be included in its annual 'Highlights Collections', including a recent paper in 2017. Three of his publications are included in the list of *Top 30 cited papers* of the journal 'Inverse Problems'. He has supervised 7 PhD projects and over 20 Master research projects on a variety of relevant practical topics.

A: PERSONAL INFORMATION

Education

1997 **Doctorate in Applied Mathematics (equiv PhD)**, *University of Münster*, Germany, Magna cum Laude ('with great honors').

1993 **MSc (German equivalent) in Mathematics**, *University of Münster*, Germany, Highest Award.

1992 **BSc in Mathematics and Physics (German equivalent, oral exams)**, *University of Münster*, Germany.

Languages

Full professional proficiency : German (native), English, Spanish

Professional working proficiency : French

Professional Experience

9/2019 – now **Senior Lecturer in Applied Mathematics**, *The University of Manchester, UK*.

9/2008 – 8/2019 **Lecturer and RCUK Fellow** , *The University of Manchester, UK*.

4/2011 – 7/2011 **Visiting Full Professor**, *University of Bremen*, Bremen, Germany, (awarded 'German University of Excellence' status in 2012).

9/2002–9/2013 **Associate Professor in Applied Mathematics (tenured) and Ramón y Cajal Fellow**, *Universidad Carlos III de Madrid, Spain*.

9/2000–8/2002 **Lecturer and Research Associate**, *University of British Columbia, Vancouver,Canada*.

9/1999–8/2000 **Visiting Research Scientist**, *Engineering Research Center for Subsurface Sensing and Imaging Sytems (CenSSIS)*, Northeastern University, Boston, MA, US.

9/1997–8/1999 **Research Associate**, *Stanford University*, Stanford, CA, US.

5/1993–5/1997 **Scientific Assistant**, *University of Münster, Germany*.

Recent administrative duties at The University of Manchester

2018–now **Member of Study Abroad Committee**.

2013–2016 **Admissions Director**, *MSc Programme in Applied Mathematics*.

2012–2020 **Nominated Faculty Disciplinary Panel member**.

2009–2016 **Programme Director**, *BSc Joint Honours Degree programme Mathematics with a Modern Language*.

2009–2016 **Erasmus Student Exchange Coordinator**, *School of Mathematics*.

2009–2016 **Personal Tutor for all Mathematics with a Modern Language students**.

2009–2016 **Personal Tutor for all Erasmus Exchange students**, *(School of Mathematics)*.

Extended Visiting Research Positions

2019-2020 **Adjunct Associate Professor, CIPR**, *King Fahd University of Petroleum & Minerals, KFUPM*, (several extended visits).

2015 (2 weeks) **Université Paris Saclay**, *DIGITEO Guest Researcher*, Plateau de Saclay, France.

2012 (2 months) **Shell Technology and Research**, *Visiting Industrial Research Scientist*, Rijswijk, The Netherlands.

2011 (1 month) **Newton Institute, Cambridge**, *Invited Participant at Special Semester on Inverse Problems*, Cambridge, UK.

2011 (1 month) **Supélec and Université Paris Sud**, *Chercheur Étranger*, Plateau de Saclay, France.

2006 (2 months) **Institute for Mathematics and its Applications (IMA)**, *Minneapolis, US*, Key participant at Special Semester on Imaging.

2005 (1 month) **Supélec and Université Paris Sud**, *Invited Associate Professor*, Plateau de Saclay, France.

2004 (4 months) **Supélec and Université Paris Sud**, *Chercheur Associé au CNRS*, Plateau de Saclay, France.

2003 (2 months) **Institute for Pure & Applied Mathematics (IPAM)**, *Invited participant at Semester on Imaging*, Los Angeles, California, US.

2002 (1 month) **Stanford University**, *Invited Participant at Mathematical Geophysics Summer School 2002*, Stanford University, Stanford, USA.

2001 (2 months) **Mathematical Sciences Research Institute (MSRI)**, *Invited Participant at Semester on Inverse Problems*, Berkeley, California, US.

2001 (1 month) **Stanford University**, *Invited Participant at Mathematical Geophysics Summer School 2001*, Stanford University, Stanford, USA.

2000 (1 month) **Stanford University**, *Invited Participant at Mathematical Geophysics Summer School 2000*, Stanford, USA.

1999 (1 month) **Stanford University**, *Invited Participant at Mathematical Geophysics Summer School 1999*, Stanford, USA.

1998 (1 month) **Stanford University**, *Invited Participant at Mathematical Geophysics Summer School 1998*, Stanford, USA.

Professional memberships

2008–now **Society of Industrial and Applied Mathematics (SIAM)**.

2006–now **European Association of Geosciences and Engineers (EAGE)**.
Platinum membership status since 2020

2007–now **Institute of Electrical and Electronics Engineers (IEEE)**.

B: RESEARCH CONTRIBUTIONS

Publication measures

- Citation index from Google Scholar on 06 Dec 2021
  - Number of citations: 2518 (726 since 2016)
  - h-index: 24 (16 since 2016)
  - i10-index: 36 (19 since 2016)
- Citation index from ISI Web of Science on 6 Dec 2021
  - Number of papers listed: 50
  - Number of citations: 1374 (1191 without self-citations)
  - h-index: 20
  - Citing articles: 924 (880 without self-citations)
- Citation index from Scopus on 06 Dec 2021
  - Number of papers listed: 55
  - Number of citations: 1555
  - h-index: 20

Some highlights:

- More than 80 peer-reviewed publications since 1997. Compare the following list of publications for details.
- Three of the publications of Dr. Dorn are included in the list of the 'top 30 cited papers' of the journal Inverse Problems: https://iopscience.iop.org/journal/0266-5611/page/top-30-cited . Compare the following list of publications for details.
- Four different publications have been selected by the journal Inverse Problems to be included on its webpage as 'featured articles of the year', in four different years. Compare the following list of publications for details.
- 5 invited and peer-reviewed topical review papers and special survey book chapters. Compare the following list of publications for details.
- A recent paper was awarded a 3rd Prize in the Best Student Paper Competition of the international conference 'Progress in Electromagnetics Research Symposium (PIERS) 2019': http://piers.org/piers/BSTAward_19Rome.php Compare the following list of publications for details.

List of Publications by Dr. Oliver Dorn

[1] A. J. Hiles and O. Dorn. Colour level set regularization for the electromagnetic imaging of highly discontinuous parameters in 3d. *Inverse Problems in Science and Engineering*, 29(4):489–524, 2021.

[2] Gabriele Incorvaia and Oliver Dorn. A deep-learning classifier for object tracking from through-the-wall radar data. In *2021 15th European Conference on Antennas and Propagation (EuCAP)*, pages 1–5, 2021.

[3] Oliver Dorn and Yifan Wu. Shape reconstruction in seismic full waveform inversion using a level set approach and time reversal. *Journal of Computational Physics*, page 110059, December 2020. doi:10.1016/j.jcp.2020.110059, https://www.sciencedirect.com/science/article/pii/S0021999120308330?via%3Dihub.

[4] Gabriele Incorvaia and Oliver Dorn. Stochastic optimization methods for parametric level set reconstructions in 2d through-the-wall radar imaging. *Electronics*, 9(2055), 2020. http://dx.doi.org/10.3390/electronics9122055 , https://www.mdpi.com/2079-9292/9/12/2055.

[5] G. Incorvaia and O. Dorn. Tracking targets from indirect through-the-wall radar observations. In *2020 14th European Conference on Antennas and Propagation (EuCAP)*, pages 1–5, 2020.

[6] A J Hiles and O Dorn. Sparsity and level set regularization for near-field electromagnetic imaging in 3d. *Inverse Problems*, 36(2):025012, jan 2020.

[7] Rossmary Villegas, Clement Etienam, Oliver Dorn, and Masoud Babaei. Shape and distributed parameter estimation for history matching using a modified ensemble kalman filter and level sets. *Inverse Problems in Science and Engineering*, 28(2):175–195, 2020.

[8] G. Incorvaia and O. Dorn. 2d through-the-wall radar imaging using a level set approach. In *2019 PhotonIcs Electromagnetics Research Symposium - Spring (PIERS-Spring)*, pages 63–72, 2019.

[9] Etienam C., Velasquez R.V., and Dorn O. Sparse multiple data assimilation with k-svd for the history matching of reservoirs. In Simon P. Faragó I., Izsák F., editor, *Progress in Industrial Mathematics at ECMI 2018*, volume 30 of *Mathematics in Industry*. Springer, 2019. https://doi.org/10.1007/978-3-030-27550-1_72.

[10] Y. Wu and O. Dorn. A level set method for shape reconstruction in seismic full waveform inversion using a linear elastic model in 2d. *Journal of Physics Conference Series*, 1131:012001, 2018. DOI https://doi.org/10.1088/1742-6596/1131/1/012001, https://iopscience.iop.org/article/10.1088/1742-6596/1131/1/012001.

[11] O. Dorn. Distributed parameter estimation for the time-dependent radiative transfer equation. In H. Antil, D Kouri, M Lacasse, and D Ridzal, editors, *Frontiers in PDE constrained Optimization*, volume 163 of *IMA Volumes in Mathematics and its Applications*, pages 341–375. Springer, 2018. DOI: 10.1007/978-1-4939-8636-1_10
This is an invited topical review/survey paper.

[12] O. Dorn and A. Hiles. A level set method for magnetic induction tomography of boxes in 3d. In D. Lesselier et al., editor, *Proceedings XXII International Workshop on Electromagnetic Nondestructive Evaluation (ENDE2017) Saclay, France, September 2017*, Electromagnetic Nondestructive Evaluation - volume XXI. IOS Press, 2018. http://ebooks.iospress.nl/volumearticle/49010, DOI: 10.3233/978-1-61499-836-5-33.

[13] K. Prieto and O. Dorn. Sparsity and level set regularization for diffuse optical tomography using a transport model in 2d. *Inverse Problems*, 33(1):014001, 2017. DOI: 10.1088/0266-5611/33/1/014001,
This paper has been included in the journal's Highlights collection for 2017.

[14] O. Dorn and D. Lesselier. *Level set methods for structural inversion and image reconstruction*, chapter 11, pages 471–532. Springer, 2nd edition, 2015. DOI: https://doi.org/10.1007/978-1-4939-0790-8_11 , This is an invited topical review/survey paper.

[15] O. Dorn and K. Prieto. From data to images: A shape based approach for fluorescence tomography. In *Science: Image in Action: Proceedings of the 7th International Workshop on Data Analysis in Astronomy.*, pages 255–266, 2012. DOI: 10.1142/9789814383295_0022, Part of: https://www.worldscientific.com/worldscibooks/10.1142/8350.

[16] O. Dorn and D. Lesselier. Level set methods for structural inversion and image reconstruction. In Scherzer O., editor, *Handbook of Mathematical Methods in Imaging*, pages 385–444. Springer-Verlag, New York, 1st edition, 2011. DOI: https://doi.org/10.1007/978-1-4939-0790-8_11.

[17] N. Irishina, D. Alvarez, O. Dorn, and M. Moscoso. Structural level set inversion for microwave breast screening. *Inverse Problems*, 26:035015, 2010. DOI: 10.1088/0266-5611/26/3/035015.

[18] R. Villegas and O. Dorn. Monitoring 3d reservoirs from csem data using a level set technique. In *Proceedings ECMOR XII*, 2010. DOI: 10.3997/2214-4609.20144973, http://earthdoc.eage.org/publication/publicationdetails/?publication=41292.

[19] O. Dorn and B. Lionheart. Introduction to the conference proceeding of the workshop on electromagnetic inverse problems, the university of manchester, uk, 15–18 june, 2009. *Journal of Physics: Conference Series*, 255(1), 2010. https://iopscience.iop.org/article/10.1088/1742-6596/255/1/011001.

[20] M. Schweiger, O. Dorn, A. Zacharopoulos, I Nissiä, and S.A. Arridge. 3d level set reconstruction of model and experimental data in diffuse optical tomography. *Optics Express*, 18:150–164, 2010. https://doi.org/10.1364/OE.18.000150.

[21] R.R. Hayes, P.A. Newill, F.J.W. Podd, T.A. York, B.D. Grieve, and O. Dorn. An investigation into the use of a mixture model for simulating the electrical properties of soil with varying effective saturation levels for sub-soil imaging using ect. *Journal of Physics: Conference Series*, 255(1), 2010. DOI: 10.1088/1742-6596/255/1/012002, https://iopscience.iop.org/article/10.1088/1742-6596/255/1/012002.

[22] M. El-Shenawee, M. Moscoso, and O. Dorn. An adjoint-field technique for shape reconstruction of 3-d penetrable object immersed in lossy medium. *IEEE Transactions on Antennas and Propagation*, 57, 2009. DOI: 10.1109/TAP.2008.2011195.

[23] N. Irishina, D. Álvarez, O. Dorn, and M. Moscoso. Detecting and imaging dielectric objects from real data: A shape-based approach. *Mathematical and Computer Modelling*, 50:743–749, 2009. https://doi.org/10.1016/j.mcm.2009.05.003.

[24] J.F.P.J Abascal, M. Lambert, D. Lesselier, and O. Dorn. Nonlinearized mapping of volumetric defects affecting a metal tube. In *Electromagnetic Nondestructive Evaluation (XII), Chapter: Studies in Applied Electromagnetics and Mechanic*, volume 32, pages 172–179, 2008. DOI:10.3233/978-1-60750-023-0-172.

[25] O. Dorn and D. Lesselier. Level set methods for inverse scattering - some recent developments. *Inverse Problems*, 25:125001, 2009. DOI: https://doi.org/10.1088/0266-5611/25/12/125001 This is an invited topical review/survey paper.

[26] D. Alvarez, O. Dorn, N. Irishina, and M. Moscoso. Crack reconstruction using a level-set strategy. *J. Comput. Phys.*, 228(16):5710–5721, 2009. DOI: 10.1016/j.jcp.2009.04.038.

[27] O. Dorn. *Numerical Methods in Multidimensional Radiative Transfer*, chapter Shape Reconstruction for an Inverse Radiative Transfer Problem Arising in Medical Imaging, pages 299–309. Springer Berlin Heidelberg, 2009. Part of DOI: 10.1007/978-3-540-85369-5_17.

[28] N. Irishina, O. Dorn, and M. Moscoso. Microwave imaging for early breast cancer detection using a shape-based strategy. *IEEE Transactions on Biomedical Engineering*, 56(4):1143–1153, 2009. DOI: 10.1109/TBME.2009.2012398.

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'Workshop on Electromagnetic Inverse Problems', June 16-19, 2009, Manchester, UK, 2009. https://pdfs.semanticscholar.org/7433/ee539c334019b1161048ad5c35434ba0610d.pdf.

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[32] J.F.P.J. Abascal, M. Lambert, D. Lesselier, and O. Dorn. 3-d eddy-current imaging of metal tubes by gradient-based, controlled evolution of level sets. *IEEE Trans. Magnetics*, 44(12):4721–4729, 2008. DOI: 10.1109/TMAG.2008.2004265.

[33] O. Dorn and R. Villegas. History matching of petroleum reservoirs using a level set technique. *Inverse Problems*, 24:035015, 2008. DOI: 10.1088/0266-5611/24/3/035015.

[34] M. El-Shenawee, O. Dorn, and M. Moscoso. An adjoint-field technique for shape reconstruction of 3-d penetrable object immersed in lossy medium. *IEEE Transactions on Antennas and Propagation*, 57(2):520–534, 2008. DOI: 10.1109/TAP.2008.2011195.

[35] N. Irishina, M. Moscoso, and O. Dorn. A level set evolution strategy in microwave imaging for early breast cancer detection. *Computers & Mathematics with Applications*, 56(3):607–618, 2008. DOI: 10.1016/j.camwa.2008.01.004.

[36] R. Villegas, O. Dorn, M. Moscoso, and M. Kindelan. Reservoir characterization using stochastic initializations and level sets. *Computers & Mathematics with Applications*, 56(3):697–708, 2008. DOI: 10.1016/j.camwa.2008.02.026.

[37] O. Dorn, H. Bertete-Aguirre, and G.C. Papanicolaou. *Lecture notes in Mathematics, Vol 1943*, chapter Adjoint fields and sensitivities for 3D electromagnetic imaging in isotropic and anisotropic media, pages 35–65. Springer-Verlag, Berlin/Heidelberg, 2008. DOI: 10.1007/978-3-540-78547-7_3.

[38] O. Dorn. *Lecture notes in Mathematics, Vol 1943*, chapter Time reversal and the adjoint imaging method with an application in telecommunication, pages 135–170. Springer-Verlag, Berlin/Heidelberg, 2008. DOI: 10.1007/978-3-540-78547-7_6.

[39] O. Dorn, M. El-Shenawee, and M. Moscoso. *Proc. 14th European Conference on Mathematics for Industry (ECMI 2006), 10-14 July 2006, Leganes, Spain*, chapter Iterative microwave inversion algorithm based on the adjoint-field method for breast cancer application, pages 587–591. Springer Berlin Heidelberg, 2008. DOI: 10.1007/978-3-540-71992-2_97.

[40] N. Irishina, M. Moscoso, and O. Dorn. *Proc. 14th European Conference on Mathematics for Industry (ECMI 2006), 10-14 July 2006, Leganes, Spain*, chapter Iterative microwave inversion for breast cancer detection using level sets, pages 592–596. Springer Berlin Heidelberg, 2008. DOI: 10.1007/978-3-540-71992-2_98.

[41] R. Villegas, O. Dorn, M Moscoso, and M. Kindelan. *Proc. 14th European Conference on Mathematics for Industry (ECMI 2006),10-14 July 2006, Leganes, Spain*, chapter

Characterization of reservoirs by evolving level set functions obtained from geostatistics, pages 597–602. Springer Berlin Heidelberg, 2008. DOI: 10.1007/978-3-540-71992-2_99.

[42] A. Zacharopoulos, O. Dorn, S.R. Arridge, V. Kolehmainen, and J. Sikora. *Proc. 14th European Conference on Mathematics for Industry (ECMI 2006),10-14 July 2006, Leganes, Spain*, chapter Reconstruction of Simple Geometric Objects in 3D Optical Tomography Using an Adjoint Technique and a Boundary Element Method, pages 603–607. Springer Berlin Heidelberg, 2008. DOI: 10.1007/978-3-540-71992-2_100.

[43] O. Dorn and D. Lesselier. *Level Set Techniques For Structural Inversion In Medical Imaging*, pages 61–90. Topics in Biomedical Engineering. International Book Series. Springer, 2007. DOI: 10.1007/978-0-387-68413-0_3.

[44] R. Villegas, O. Dorn, M. Moscoso, and M. Kindelan. Shape reconstruction from two-phase incompressible flow data using level sets. In X.C. Tai, K.A. Lie, T.F. Chan, and S. Osher, editors, *Image Processing Based on Partial Differential Equations*, Mathematics and Visualization, pages 381–401. Springer, 2007. https://doi.org/10.1007/978-3-540-33267-1_21.

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[47] O. Dorn and R. Villegas. A level set method for 3d low frequency electromagnetic imaging with applications in geophysical prospecting. *PAMM Proc. in Appl. Math. and Mech.*, 7:2150023–2150024, 2007. DOI: https://doi.org/10.1002/pamm.200700605.

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[50] N. Irishina, M. Moscoso, and O. Dorn. Microwave tomography for breast cancer detection using level sets. In *Proc. 23rd International Review of Progress in Applied Computational Electromagnetics Conference ACES 2007, March 19-23, 2007, Verona, Italy*, pages 1955–1960, 2007. https://pdfs.semanticscholar.org/f9b2/43a2cfaa5a79e72cf9db1284326d5f612d15.pdf.

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[53] O. Dorn and U. Ascher. Shape reconstruction in 3d electromagnetic induction tomography using a level set technique. In *Proc. 23rd International Review of Progress in Applied Computational Electromagnetics Conference ACES 2007, March 19–23, 2007, Verona, Italy*, pages 695–700, 2007. https://pdfs.semanticscholar.org/8d34/c9dd4f883caf04ec577de127c1bf2ed6a127.pdf.

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[57] M. Schweiger, S. Arridge, O. Dorn, A. Zacharopoulos, and V. Kolehmainen. Reconstruction absorption and diffusion shape profiles in optical tomography using a level set technique. *Optics Letters*, 31(4):471–473, 2006. DOI: 10.1364/OL.31.000471.

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[59] M. Soleimani, W.R.B. Lionheart, and O. Dorn. Level set reconstruction of conductivity and permittivity from boundary electrical measurements using experimental data. *Inverse Problems in Science and Engineering*, 14(3):193–210, 2006. DOI: 10.1080/17415970500264152.

[60] A. Zacharopoulos, S.R. Arridge, O. Dorn, V. Kolehmainen, and J. Sikora. 3d shape reconstruction in optical tomography using spherical harmonics and bem. In *Proceedings Progress in Electromagnetics Research Symposium PIERS, Cambridge, March 2006*, pages 48–52, 2006. http://piers.org/piersproceedings/piers2k6Proc.php.

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[62] N. Irishina, M. Moscoso, and O. Dorn. Detection of small tumors in microwave medical imaging using level sets and music. In *Proceedings Progress In Electromagnetics Research Symposium (PIERS), Cambridge, March 2006*, pages 43–47, 2006. https://www.researchgate.net/publication/245553982.

[63] O. Dorn and D. Lesselier. Topical review: Level set methods for inverse scattering. *Inverse Problems*, 22:R67–R131, 2006. DOI: 10.1088/0266-5611/22/4/R01, This paper has been included in the journal's Highlights Collection for the year 2006, This paper is on the list of the 'top 30 cited papers' of the journal Inverse Problems https://iopscience.iop.org/journal/0266-5611/page/top-30-cited, This is an invited topical review/survey paper.

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using spherical harmonics parameterisation and a boundary element methods. *Inverse Problems*, 22:1509–1532, 2006. DOI: 10.1088/0266-5611/22/5/001.

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Funded research projects as Principal Investigator

2021–2025 **Artificial Intelligence and Advanced Modelling for Ground Penetrating Radar and Mine Detection**, *(3.5 years PhD Studentship)*, School of Natural Sciences Strategic MMMSI- DTP Mathematical Modelling Award.

2018–2022 **Through-Wall Radar Imaging and Object Characterization and Tracking**, *(4 years PhD Studentship, funded by company DSTL, UK)* , industry funded.

2016–2019 **Novel algorithms for magnetic induction tomography with applications in security screening**, *(3.5 years PhD studentship, funded by UK Home Office in collaboration with NNSP/AWE, UK)*, industry funded.

2015 **MAPLE workshop Grant by the University of Manchester**, *for the workshop 'Compressive Sensing and Sparsity: Theory and Applications in Tomography, The University of Manchester, 12th & 13th November 2015*.

2014–2017 **A Level Set Approach for Imaging Cargo Containers Using Gravity Gradiometry**, *(3.5 years PhD studentship, funded by company NNSP/AWE, UK.)*, industry funded.

2012 **Shell Projects and Technology**, *funded project on 'Level Set Methods for Seismic Imaging' (Teaching buyout for one semester and funded research stay at Shell research lab in Rijswijk, The Netherlands.)*, industry funded.

2011 **Royal Society Travel Grant**, *Grant 7th international workshop on Data Analysis in Astronomy. Science: Image in Action. DAA2011* .

2010 **DIGITEO research grant**, *for visiting Supelec-L2S-Universite Paris Sud, France, for one month*, industrial collaboration.

2010–2013 **Programa I3 of the Agencia Nacional de Evaluación y Prospectiva (ANEP) of Spain.**, *This is an award for research of excellence in Spain.*, (130.000 Euros).

2009–2010 **EPSRC grant EP/G065047/1 'Interdisciplinary Workshop on Electromagnetic Inverse Problems'**.

2009 **Innovation voucher with Industrial Tomography Systems (ITS) plc., development of novel algorithms for industrial ERT/ECT**, *industry funded*.

2004–2009 **European Integrated Project on 'Integrated Technologies for In-vivo Molecular Imaging'**, *financed by the European Union in the 6th Framework Programme for Research and Technological Development. Involved are 21 Universities, Research Institutes and Companies in Europe with a total budget of 11.000.000 Euros. Dr. Dorn was Principal Investigator at UC3M.* , industrial collaboration.

2005–2009 **Complementary Funding for research related with the European project 'Integrated Technologies for In-vivo Molecular Imaging'**, *by the Ministerio de Educación y Ciencia, Spain.* , industrial collaboration.

2005–2009 **Complementary Funding for research related with the European project 'Integrated Technologies for In-vivo Molecular Imaging'**, *Universidad Carlos III de Madrid, Spain.* , industrial collaboration.

2002–2003 **'New nonlinear reconstruction techniques for medical and geophysical imaging'**, *sponsored by the Ministerio de Ciencia y Tecnologia, Spain, and the Universidad Carlos III de Madrid, Spain.* .

Funded research projects as Co-Investigator

2012–2013 **Building Global Engagements Grant "Manchester Image Reconstruction and ANalysis (MIRAN)**, *): enhancing international interdisciplinary collaboration to address major challenges*, (PI: Bill Lionheart).

2011-2012 **EPSRC strategic funding competition**, *grant on the topic 'Multidisciplinary Inverse Problems' (PI: Bill Lionheart).*

2011-2012 **'MathExplorer: Transforming student learning of mathematical concepts in Year 2 EEE'**, *at the University of Manchester (PI: Martin Brown).*

2011 **EPSRC - KTA Concept and Feasibility study**, *The detection of underground anti-personnel land mines using electrical impedance and ultrasound tomography (PI: Bill Lionheart)*, industrial collaboration.

2008–2010 **'Modelos Computacionales para Técnicas No Invasivas de Reconstrucción de Imagen de Interés en Biomedicina'**, *(sponsored by the Ministerio de Educación y Ciencia, Spain) PI: Miguel Moscoso, UC3M.* .

2005–2007 **'Multiscale problems in materials: defects and growth'**, funded by the Minsterio de Educación y Ciencia, Spain. PI: Luis Bonilla, UC3M. .

2005–2007 **'Reservoir Characterization using static and dynamic data: the use of geostatistics in history matching'**, *sponsored by the Spanish Oil company REPSOL-YPF. PI: Manuel Kindelan, UC3M.* , industry funded.

2005–2007 **'Efficient numerical algorithms for microwave imaging: applications to the early detection of breast cancer'**, *funded by the Ministerio de Ciencia y Tecnologia, Spain. PI: Miguel Moscoso, UC3M.* .

2005–2007 **'Reservoir Characterization using static and dynamic data: Characterization of reservoirs using a level set technique'**, *sponsored by the Spanish Oil company REPSOL-YPF. PI: Manuel Kindelan, UC3M.* , industry funded.

2003–2005 **'Reservoir Characterization'**, *sponsored by the company REPSOL-YPF and by Universidad Carlos III de Madrid. PI: Manuel Kindelan, UC3M.* , industry funded.

2002–2005 **'Discrete Travelling Waves: Interfaces of Domains, Dislocations and Cracks'**, *sponsored by the Ministerio de Ciencia y Tecnologia, Spain. PI: Luis Bonilla, UC3M.* .

2002-2005 **Research Training Network on 'Hyperbolic and Kinetic Equations'**, *financed by the European Union in the 5th Framework Programme 'Improving the Human Potential', Project No. HPRN-CT-2002-00282. PI: Juan Soler (Universidad Granada) and Luis Bonilla (UC3M).*

2002–2005 **Consortium on 'Imaging, Time Reversal and Communication in Random Media'**, *in collaboration with research groups at University of Irvine, Stanford University, and North Carolina State University, sponsored by the Office of Naval Research (ONR), USA. PI: Hongkai Zhao (UC Irvine).*

2000-2002 **Consortium on 'Inversion and Modelling of Applied Geophysical Electromagnetic data'**, *sponsored by NSERC through its Collaborative Research and Development (CRD) program, and the following companies: Newmont, Rio Tinto, Falconbridge, Placer Dome, Anglo American, INCO, MIM, Cominco, AGIP, Muskox Minerals, Billeton. PIs: Doug Oldenburg (UBC) and Uri Ascher (UBC)*, industry funded.

1999–2000 **Research project 'New shape-based reconstruction techniques for 2D electromagnetic cross-borehole tomography', sponsored by the Department of Energy and the Idaho National Energy and Environmental Laboratory**, *At the Center for Subsurface Sensing and Imaging Systems, Northeastern University (NEU), Boston, USA. PI: Eric Miller, (CenSSIS)*, industrial collaboration.

1997–1999 **Environmental Management Science Program of the US department of energy DOE, project No 55011 'Surface and Borehole Electromagnetic Imaging of Conducting Contaminant Plumes'.**, *A collaborative project with participants from the Mathematics Department at Stanford University and from Lawrence Livermore National Laboratory. PIs: Jim Berryman (LLNL) and George Papanicolaou (Stanford University).*, industrial collaboration.

Doctoral and PhD theses supervised

The University of Manchester

- (2021–2025) Daniel Ball *Artificial Intelligence and Advanced Modelling for Ground Penetrating Radar and Mine Detection* MMMSI/DTP funded, joint with Frank Podd, EEE.
- (2018–2021) Gabriele Incorvaia *Through-Wall Radar Imaging and Object Characterization and Tracking*, industry funded.
- (2016–2020) Alex Hiles, *Novel algorithms for magnetic induction tomography with applications in security screening*, industry funded.
- (2014–2018) Yifan Wu, *Shape-based methods for seismic full-waveform inversion*.
- (2014–2018) David Leahy, *Modern Mathematical Tools for Gravity and Gradiometry Imaging with a special emphasis on Cargo Container Screening*, industry funded.
- (2010–2014) Kernel Prieto, *Novel mathematical techniques for structural inversion and image reconstruction in medical imaging governed by a transport equation*, funded by CONACyT, Mexico.

Universidad Carlos III de Madrid

- (2003–2009) Natalia Irishina, *Level set methods for microwave medical imaging*. *This thesis was awarded a Premio Extraordinario de Doctorado (Award of Excellence) in the category Ingenieria Matematica, a prestigious research award, in 2009 by Universidad Carlos III de Madrid.*
- (2003–2007) Rossmary Villegas, *Level Set Methods for Reservoir Characterization*, industry funded. *This thesis was awarded a Premio Extraordinario de Doctorado (Award of Excellence) in the category Ingenieria Matematica, a prestigious research award, in 2008 by Universidad Carlos III de Madrid.*

C: OTHER EVIDENCE OF PROFESSIONAL AND ACADEMIC STANDING

Some further professional duties and activities

- International Advisory Board/Editorial Board member of the international journal 'Inverse Problems' (since 2008) http://www.iop.org/EJ/journal/IP
- Consulted regularly by national funding agencies of various countries for evaluating research proposals or outcomes, amongst others: US, Italy, Finland, UK.
- Appointed external PhD examiner at prestigious universities in various countries, amongst them: Spain, Canada, UK, France, Italy.
- More than 80 peer-reviewed research papers in internationally recognized journals, conference proceedings or edited books.
- More than 150 (mostly invited) oral or poster presentations during 1999-2019.
- Edited and co-edited several special focus sessions at peer-reviewed international research journals.
- Long-standing experience in organizing international workshops as well as special sessions and minisymposia at international conferences.
- Scientific committee member of more than 10 international conferences and workshops.

D: TEACHING AND LEARNING

Teaching by Dr. Oliver Dorn

The University of Manchester

- 2020/2021: MATH46132/MATH66132: Numerical Optimization and Inverse Problems.
- 2020/2021: MATH10212: Linear Algebra B.
- 2019/2020: MATH46132/MATH66132: Numerical Optimization and Inverse Problems.
- 2019/2020: MATH19872: Mathematics 0D2, Foundation Year.
- 2018/2019: MATH46132/MATH66132: Numerical Optimization and Inverse Problems.
- 2018/2019: 29661 (2M1): Engineering Mathematics for 2nd year Mechanical, Aerospace, and Civil Engineers
- 2017/2018: MATH46132/MATH66132: Numerical Optimization and Inverse Problems.
- 2017/2018: 29661 (2M1): Engineering Mathematics for 2nd year Mechanical, Aerospace, and Civil Engineers
- 2016/2017: MATH46132/MATH66132: Numerical Optimization and Inverse Problems.
- 2015/2016: MAGIC079: Inverse Problems (joint with University Leeds)
- 2015/2016: MATH46132/MATH66132: Numerical Optimization and Inverse Problems.
- 2015/2016: Undergraduate course CHEN10011: Engineering Mathematics 1 for Chemical and Petroleum Engineers
- 2014/2015: MAGIC079: Inverse Problems (joint with University Leeds)
- 2014/2015: MATH46132/MATH66132: Numerical Optimization and Inverse Problems, University of Manchester.
- 2014/2015: Undergraduate course CHEN10011 Engineering Mathematics I for Chemical Engineers and Petroleum Engineers.
- 2013/2014: MAGIC079: Inverse Problems (joint with University Leeds)
- 2013/2014: MATH46132/MATH66132: Numerical Optimization and Inverse Problems, University of Manchester.
- 2013/2014: Undergraduate course CHEN10011 Engineering Mathematics I for Chemical and Petroleum Engineers.
- 2012/2013: MAGIC079: Inverse Problems (joint with University Leeds)
- 2012/2013: MATH46132/MATH66132: Numerical Optimization and Inverse Problems
- 2011/2012: Undergraduate course MATH 29681, Mathematics for Electrical and Electronic Engineers.
- 2011/2012: Undergraduate course MATH29831, Mathematics for Optometrists.

Universität Bremen

- 2011/2012 Nichtlineare Inverse Probleme (in German)
- 2011/2012 Seminar zu Nichtlinearen Inversen Problemen (in German)

The University of Manchester

- 2010/2011: Undergraduate course units MATH29641 and MATH29631, Mathematics for Electrical Engineers.
- 2009/2010, Undergraduate course unit MATH 29641 / MATH 29651, Mathematics for Electrical Engineers.
- 2008/2009, MATH 45152 Inverse Problems and Imaging, School of Mathematics

Universidad Carlos III de Madrid

- 2007/2008, Undergraduate Course Análisis Numérico (in Spanish)
- 2006/2007: Master's course 'Introduction in Inverse Problems and Imaging'.
- 2006/2007, Undergraduate Course Análisis Numérico (in Spanish)
- Spring 2006, Graduate Course Nonlinear Inverse Problems and Tomography
- 2005/2006, Undergraduate Course Análisis Numérico (in Spanish)
- 2005/2006, Graduate Course Nonlinear Inverse Problems and Tomography
- 2005/2006, Graduate Course Introduction in Inverse Problems and Imaging
- 2004/2005, Undergraduate Course Métodos Numéricos en Ingeniería (in Spanish)
- 2003/2004, Graduate Course Introduction in Inverse Problems and Imaging.

The University of British Columbia

- 2001/2002, Undergraduate Course CPSC 303 Numerical Approximation and Discretization
- 2000/2001, Undergraduate Course CPSC 302 Numerical Computation for Algebraic Problems

Stanford University

- Spring 1999 Graduate Course MATH 246B Inverse Transport Problems in Medical Imaging, Mathematics Department