

# CURRICULUM VITAE

## Dr. Mikhail Filatov

### Lecturer

Technological University Dublin  
School of Chemical and Biopharmaceutical Sciences

### Contact Information

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### • Professional Experience

- 10/2017–current Lecturer in Organic Chemistry  
School of Chemical and Biopharmaceutical Sciences, Technological University Dublin, Ireland
- 09/2015 – 09/2017 Marie Curie Research Fellow (MSCA-IF)  
School of Chemistry, Trinity College Dublin, Ireland
- 04/2014 – 07/2015 Researcher in EU project POLINNOVA  
Institute of Polymers, Bulgarian Academy of Sciences, Sofia, Bulgaria
- 02/2010 – 03/2014 Postdoctoral Researcher  
Max Planck Institute for Polymer Research, Mainz, Germany
- 12/2008 – 12/2009 CNRS Postdoctoral Researcher  
Institute of Molecular Chemistry, University of Burgundy, Dijon, France
- 06/2008 – 07/2008 Visiting Researcher  
Department of Biochemistry and Biophysics, University of Pennsylvania, Philadelphia, USA
- 08/2005 – 10/2008 Managing Director  
Esterkem Ltd., private chemical company, Moscow, Russia

### • Education

- 01/2020 – 06/2020 Postgraduate Certificate in University Learning and Teaching  
Learning, Teaching and Technology Centre (LTTC), TU Dublin, Ireland
- 10/2005 – 11/2008 PhD in Organic Chemistry  
Department of Chemistry, Moscow State University, Moscow, Russia  
Thesis title: "General synthetic approach to porphyrins and dipyrins with  $\pi$ -extended system". Supervisors: I.P. Beletskaya and A.V. Cheprakov
- 09/2000 – 07/2005 Diploma of Chemist (with honours)  
Department of Chemistry, Moscow State University, Moscow, Russia

### • Research Interests and Expertise

**Organic chemistry.** Multistep organic synthesis of functional dyes:  $\pi$ -extended porphyrins, metal dipyrins, boron dipirromethenes (BODIPY). Synthesis and chemical modification of photoactive materials: metal-organic frameworks, sol-gels, functionalized biopolymers (chitosan, cellulose acetate).

**Photochemistry.** Singlet oxygen: generation, sensing and application in organic synthesis. Photoinduced electron transfer (PET) in donor-acceptor molecules. Spin-orbit charge-transfer intersystem crossing (SOCT-ISC) dyes and their application as sensitizers in photodynamic therapy, photon upconversion and photopolymerization.

**Materials Chemistry.** Synthesis and chemical modification of photoactive materials: metal-organic frameworks, sol-gels, functionalized biopolymers (chitosan, cellulose acetate). Photopolymers for holography. Refractive index modulation materials. Oxygen barrier materials.

## • Research Funding/Awards

- 2022 – current Science Foundation Ireland  
Frontiers for the Future Award (Principal Investigator)  
Project: “Dyes with Switchable Intersystem Crossing for Photonics”
- 2020 – 2024 TU Dublin Research Scholarship (Principal Investigator)  
Project: “Heavy-Atom-Free Photosensitizing Materials”
- 2015 – 2017 European Commission, Horizon 2020 Programme Grant (Principal Investigator)  
Project: “Controlled Singlet Oxygen Release Sensitizer in Photodynamic Therapy”
- 2010 – 2014 Max Planck Society Scholarship  
Project: “New Functional Dyes for NIR to Visible Light Upconversion”
- 2005 – 2006 Russian Foundation for Assistance to Small Innovative Enterprises (spin-off)  
Project: “Development of Technology of 24-Epibrassinolide Production”

## • Teaching Experience

### Currently taught modules

CHEM1007 – Introduction to Chemistry  
CHEM2008 – Organic Chemistry  
CHEM2022 – Spectroscopy  
CHEM2024 – Pharmaceutical & Bioorganic Chemistry  
CHEM2025 – Medicinal Chemistry & Pharmchem Processes  
CHEM3011 – Organic Chemistry & Stereochemistry  
CHEM4008 – Topics in Medicinal Chemistry

### Previously taught modules:

CHEM1002 – Introduction to Chemistry  
CHEM2009 – Principles of Drug Action  
CHEM2023 – Organic Chemistry  
CHEM3003 – Organic Chemistry & Stereochemistry  
CHEM4004 – Advanced Organic Chemistry

## • Departmental admin roles

Phys2Life Research Hub Executive Committee member  
Year coordinator for DT261-2 group (2<sup>nd</sup> year BSc in Medicinal Chemistry & Pharmaceutical Sciences)  
Module coordinator for CHEM3011 - Organic Chemistry & Stereochemistry

## • Reviewer Activities

### Journal articles reviewed (255)

Acted as a referee and adjudicative referee for 40 academic journals.

*Chemical Communications* (69), *The Journal of Organic Chemistry* (29), *ChemistrySelect* (25), *Chemistry–A European Journal* (16), *Physical Chemistry Chemical Physics* (16), *Angewandte Chemie International Edition* (14), *Journal of Materials Chemistry C* (11), *Chemical Science* (7), *Journal of Physical Chemistry* (7), *Photochemical and Photobiological Sciences* (7), *Dyes and Pigments* (6), *ACS Materials Letters* (5), *Journal of the American Chemical Society* (5), *RSC Advances* (4), *New Journal of Chemistry* (3), *JACS Au* (2), *Chemistry and Biodiversity* (2), *European Journal of Inorganic Chemistry* (2), *Small* (2), *Nanoscale* (2), *Nature Communications* (2), *Journal of Physical Chemistry Letters* (2), *Asian Journal of Organic Chemistry* (2), *Accounts of Chemical Research* (1), *Electroanalysis* (1), *Chemistry – An Asian Journal* (1), *ChemPhotoChem* (1), *ChemPhysChem* (1), *Organic Letters* (1), *ACS Central Science* (1), *Photochemistry&Photobiology* (1), *Japanese Journal of Applied Physics* (1), *Applied Organometallic Chemistry* (1), *Advanced Optical Materials* (1), *Sustainable Food Technology* (1), *Applied Research* (1), *ACS Catalysis* (1), *ACS Omega* (1), *Chemical Reviews* (1).

Reviewer Identifier: <https://www.webofscience.com/wos/author/record/A-2266-2013>

## Funding applications reviewed (29)

Acted as a referee for the following funding agencies: European Commission H2020 – Marie Curie IEFs, ANR (Agence nationale de la recherche), Polish National Science Centre.

### • Patents

1. Long-term stable composition, such as phosphorescent composition or TTA-photon upconversion composition, EP 2 851 407 A1, US 2016/0222286 A1, WO 2015/044129 A1, **2015**
2. Method of Synthesis of 5,5'-Disubstituted  $\pi$ -extended Dipyrrromethenes and Their Use as Analytical Reagents for Metal Ions and Fluorescent Imaging Probes, US 2011/0144351 A1, **2009**
3. Method of Reduction of Unsaturated Ketones into Saturated Ketones, RU 2 293 720 C1, **2007**
4. Method of Synthesis of 24-Epibrassinolide, RU 2 272 044 C1, **2006**

### • Publications

Summary: 44 scientific papers published (22 as a corresponding author), 1 book chapter, 4 patents.  
*h* index = 26 (Google Scholar), > 2200 citations  
<https://scholar.google.bg/citations?user=g1ldjV4AAAAJ&hl=ru>  
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### Peer-review articles

(\* corresponding author)

44. M. Dvoracek, B. Twamley, M.O. Senge, M.A. Filatov, Unprecedented visible light-initiated topochemical [2 + 2] cycloaddition in a functionalized bimane dye. *Beilstein J. Org. Chem.* **2025**, *21*, 500–509.
43. M.A. Filatov\*, T. Mikulchyk, M. Hodée, M. Dvoracek, V.N.K. Mamillapalli, A. Sheehan, C. Newman, S.M. Borisov, D. Escudero, I. Naydenova, Enhancement of Intersystem Crossing in Asymmetrically Substituted BODIPY Photosensitizers. *J. Mater. Chem. C*, **2025**, doi: 10.1039/D4TC04850D.
42. A. Sheehan, I.A. Okkelman, G. Gros Lambert, C. Bucher, R.I. Dmitriev, M.A. Filatov\*, Optoelectronic Properties and Fluorescence Lifetime Imaging Application of Donor-Acceptor Dyads Derived From 2,6-DicarboxyBODIPY. *Chem. Eur. J.*, **2025**, doi: 10.1002/chem.202404188. **Highlighted on the front cover.**
41. I.A. Abdulaeva, M.A. Filatov\*, A. Kechiche, A. Bessmertnykh-Lemeune, Indium Imidazo[4,5-*b*]porphyrins as Photocatalysts for Oxidation of Sulfides. *Molecules*, **2025**, *30*, 864.
40. P.P. Chebotaev, A.A. Buglak, A. Sheehan, M.A. Filatov\*, Predicting fluorescence to singlet oxygen generation quantum yield ratio for BODIPY dyes using QSPR and machine learning. *Phys. Chem. Chem. Phys.*, **2024**, *26*, 25131-25142.
39. K. Coldrick, C. Newman, J. Doran, G. Amarandei, M.A. Filatov\*, Enhancing Hybrid Photovoltaic-Thermal System Efficiency with Boron Dipyrrromethene Dyes, *ACS Appl. Opt. Mater.*, **2024**, *2*, 1985–1998.
38. A. Sheehan, T. Mikulchyk, S. Karuthedath, C. De Castro, S. Karuthedath, W. Althobaiti, M. Dvoracek, Sabad-e-Gul, H.J. Byrne, F. Laquai, I. Naydenova, M.A. Filatov\*, Diethoxycarbonyl-BODIPYs as heavy-atom-free photosensitizers for holographic recording in cellulose acetate photopolymer, *J. Mater. Chem. C*, **2023**, *11*, 15084-15096.
37. J. Isokuortti, T. Griebenow, J.-S. von Glasenapp, T. Raeker, M.A. Filatov, T. Laaksonen, R. Herges, N.A. Durandin, Triplet sensitization enables bidirectional isomerization of diazocine with 130 nm redshift in excitation wavelengths, *Chem. Sci.*, **2023**, *14*, 9161-9166.
36. T. Mikulchyk, S. Karuthedath, C. De Castro, A.A. Buglak, A. Sheehan, A. Wieder, F. Laquai, I. Naydenova, M.A. Filatov\*, Charge Transfer Mediated Triplet Excited State Formation in Donor-Acceptor-Donor BODIPY: Application for Recording of Holographic Structures in Photopolymerizable Glass, *J. Mater. Chem. C*, **2022**, *10*, 11588-11597. **Highlighted on the back cover.**
35. G.V. Morozkov, A.S. Abel, M.A. Filatov, S.E. Nefedov, V.A. Roznyatovsky, A.V. Cheprakov, A.Yu. Mitrofanov, I.S. Ziankou, A. Averin, I.P. Beletskaya, J. Michalak, C. Bucher, L. Bonneviot, A. Bessmertnykh-

- Lemeune, Ruthenium(II) complexes with phosphonate-substituted 1,10-phenanthroline ligands: synthesis, characterization and use in organic photocatalysis, *Dalton Trans.*, **2022**, *51*, 13612-13630. **Highlighted on the front cover.**
34. N. Kiseleva, M.A. Filatov, J.C. Fischer, M. Kaiser, M. Jakoby, D. Busko, I.A. Howard, B.S. Richards, A. Turshatov\* BODIPY–pyrene donor–acceptor sensitizers for triplet–triplet annihilation upconversion: the impact of the BODIPY-core on upconversion efficiency. *Phys. Chem. Chem. Phys.*, **2022**, *24*, 3568-3578.
33. A.A. Buglak, A. Charisiadis, A. Sheehan, C.J. Kingsbury, M.O. Senge, M.A. Filatov\* Quantitative Structure–Property Relationship Modelling for the Prediction of Singlet Oxygen Generation by Heavy-atom-free BODIPY Photosensitizers. *Chem. Eur. J.*, **2021**, *27*, 9934-9947.
32. J. Isokuortti, K. Kuntze, M. Virkki, Z. Ahmed, E. Vuorimaa-Laukkanen, M.A. Filatov, A. Turshatov, T. Laaksonen, A. Priimagi, N. Durandin, Expanding Azobenzene Photoswitching into Near-Infrared via Endothermic Triplet Energy Transfer. *Chem. Sci.*, **2021**, *12*, 7504-7509.
31. N. Kiseleva, D. Busko, B.S. Richards, M.A. Filatov\*, A. Turshatov, Determination of Upconversion Quantum Yields Using Charge-Transfer State Fluorescence of Heavy-Atom-Free Sensitizer as a Self-Reference. *J. Phys. Chem. Lett.*, **2020**, *11*, 6560-6566.
30. A. A. Buglak, M.A. Filatov, M.A. Hussain, M. Sugimoto, Singlet Oxygen Generation by Porphyrins and Metalloporphyrins Revisited: a Quantitative Structure-Property Relationship (QSPR) Study. *J. Photochem. Photobiol. A*, **2020**, *43*, 112833.
29. M.A. Filatov\* Heavy-atom-free BODIPY Photosensitizers with Intersystem Crossing Mediated by Intramolecular Photoinduced Electron Transfer. *Org. Biomol. Chem.*, **2020**, *18*, 10-27.
28. S. Callaghan, M.A. Filatov, H. Savoie, R.W. Boyle, M.O. Senge, In vitro cytotoxicity of a library of BODIPY-anthracene and -pyrene dyads for application in photodynamic therapy. *Photochem. Photobiol. Sci.*, **2019**, *18*, 495-504.
27. M.A. Filatov\*, S. Karuthedath, P.M. Polestshuk, S. Callaghan, K. Flanagan, T. Wiesner, F. Laquai, M.O. Senge, BODIPY-Pyrene and Perylene Dyads as Heavy-Atom-Free Singlet Oxygen Sensitizers. *ChemPhotoChem*, **2018**, *2*, 606-615. **Top downloaded paper 2018-2019.**
26. M.A. Filatov\*, S. Karuthedath, P.M. Polestshuk, S. Callaghan, K. Flanagan, M. Telitchko, T. Wiesner, F. Laquai, M.O. Senge, Control of triplet state generation in heavy atom-free BODIPY–anthracene dyads by media polarity and structural factors. *Phys. Chem. Chem. Phys.*, **2018**, *20*, 8016-8031. **PCCP 2018 Hot Articles Collection.**
25. N. Kiseleva, M.A. Filatov\*, M. Oldenburg, D. Busko, M. Jakoby, I.A. Howard, B.S. Richards, M.O. Senge, S.M. Borisov, A. Turshatov, The Janus-Faced Chromophore: A Donor-Acceptor Dyad with Dual Performance in Photon Up-conversion. *Chem. Commun.*, **2018**, *54*, 1607-1610.
24. M.A. Filatov\*, S. Karuthedath, P.M. Polestshuk, H.Savoie, K.J. Flanagan, C. Sy, E. Sitte, M. Telitchko, F. Laquai, R.W. Boyle, M.O. Senge, Generation of Triplet Excited States via Photoinduced Electron Transfer in meso-anthra-BODIPY: Fluorogenic Response toward Singlet Oxygen in Solution and *in Vitro*. *J. Am. Chem. Soc.*, **2017**, *139*, 6282–6285.
23. S. Callaghan, M.A. Filatov\*, E. Sitte, H. Savoie, R.W. Boyle, K.J. Flanagan, and M.O. Senge, Delayed release singlet oxygen sensitizers based on pyridone-appended porphyrins. *Photochem. Photobiol. Sci.*, **2017**, *16*, 1371-1374. **Highlighted on the front cover.**
22. M.A. Filatov\*, M.O. Senge, Molecular devices based on reversible singlet oxygen binding in optical and photomedical applications. *Mol. Syst. Des. Eng.*, **2016**, *1*, 258-272. **Highlighted on the front cover.**
21. M.A. Filatov\*, S. Balushev, K. Landfester, Protection of Densely Populated Excited Triplet State Ensembles Against Deactivation by Molecular Oxygen. *Chem. Soc. Rev.*, **2016**, *45*, 4668-4689. **Highlighted on the front cover.**
20. T.G.B. de Souza, M.G. Vivas, C.R. Mendonça, S. Plunkett, M.A. Filatov, M.O. Senge, L. De Boni, Studying the intersystem crossing rate and triplet quantum yield of meso-substituted porphyrins by means of pulse train fluorescence technique. *J. Porphyrins Phthalocyanines*, **2016**, *20*, 1–10.

19. M.A. Filatov\*, F. Etzold, D. Gehrig, F. Laquai, D. Busko, K. Landfester, S. Balushev, Interplay between singlet and triplet excited states in a conformationally locked donor–acceptor dyad. *Dalton Trans.*, **2015**, 44, 19207-19217.
18. M.A. Filatov\*, E. Heinrich, K. Landfester, S. Balushev, meso-Tetraphenylporphyrin with a pi-system extended by fusion with anthraquinone. *Org. Biomol. Chem.*, **2015**, 13, 6977-6983.
17. M.A. Filatov\*, E. Heinrich, D. Busko, I.Z. Ilieva, K. Landfester, S. Balushev, Reversible Oxygen Addition on a Triplet Sensitizer Molecule: Protection from Excited States Depopulation. *Phys. Chem. Chem. Phys.*, **2015**, 17, 6501-6510.
16. M.A. Filatov, S. Ritz, I. Ilieva, V. Mailänder, K. Landfester, S. Balushev, Extending the infrared limit of oxygenic photosynthesis. *SPIE Newsroom*, **2014**, doi: 10.1117/2.1201403.005378.
15. C. Wohnhaas, V. Mailänder, M. Dröge, M.A. Filatov, D. Busko, Y. Avlasevich, Stanislav Balushev, T. Miteva, K. Landfester, A. Turshatov, Fabrication of low-power upconverting nanocapsules for bioimaging in red and far-red spectral regions. *Macromolecular Bioscience*, **2013**, 13, 1422–1430.
14. M.A. Filatov\*, S. Balushev, I.Z. Ilieva, V. Enkelmann, T. Miteva, K. Landfester, S. Aleshchenkov, A.V. Cheprakov, Tetraanthraporphyrins: synthesis, structure and optical properties. *J. Org. Chem.*, **2012**, 77, 11119–11131.
13. P.D. Harvey, A. Langlois, M.A. Filatov, D. Fortin, K. Ohkubo, S. Fukuzumi, R. Guilard, Decoupling the Artificial Special Pair to Slow Down the Rate of Singlet Energy Transfer. *J. Porphyrins Phthalocyanines*, **2012**, 16, 8-10.
12. E.R. Ranyuk, M.A. Filatov, A.D. Averin, A.V. Cheprakov, I.P. Beletskaya, The Synthesis of Highly Basic  $\pi$ -Extended Porphyrins by Palladium Catalyzed Amination. *Synthesis*, **2012**, 3, 393-398.
11. S. Thyagarajan, B. Ghosh, M.A. Filatov, A.V. Moore, A.V. Cheprakov, S.A. Vinogradov, Near infrared dipyrin-based fluorogenic chelators for metal ions. *Proc. SPIE*, **2011**, 7910, 79100Z.
10. P.D. Harvey, M.A. Filatov, R. Guilard, Bis- and Trisporphyrin Bio-Inspired Models for Bacterial Antennas and Photosystems. *J. Porphyrins Phthalocyanines*, **2011**, 15, 1-22.
9. M.A. Filatov, A.V. Cheprakov, The Synthesis of New Tetrabenz- and Tetranaphthoporphyrins via the Addition Reactions of 4,7-Dihydroisindole. *Tetrahedron*, **2011**, 3559-3566.
8. M.A. Filatov, F. Laquai, D. Fortin, R. Guilard, P.D. Harvey, Strong Donor–Acceptor Couplings in a Special Pair-Antenna Model. *Chem. Comm.*, **2010**, 46, 9176-9178.
7. M.A. Filatov, A. Y. Lebedev, S.N. Mukhin, S. A. Vinogradov and A. V. Cheprakov,  $\pi$ -Extended Dipyrins Capable of Highly Fluorogenic Complexation with Metal Ions. *J. Am. Chem. Soc.*, **2010**, 132, 9552-9554.
6. M.A. Filatov, R. Guilard, P. Harvey, Selective Stepwise Suzuki Cross-coupling Reaction for the Modelling of Photosynthetic Donor–Acceptor Systems. *Org. Lett.*, **2010**, 12, 196-199.
5. A.V. Cheprakov, M.A. Filatov, The Dihydroisindole Approach to  $\pi$ -Extended Porphyrins. *J. Porphyrins and Phthalocyanines*, **2009**, 13, 291-303.
4. A.Y. Lebedev, M.A. Filatov, A.V. Cheprakov, S.A. Vinogradov, Effects of Structural Deformations on Optical Properties of Tetrabenzoporphyrins: Free-bases and Pd Complexes. *J. Phys. Chem. A*, **2008**, 112, 7723-7733.
3. M.A. Filatov, A.Y. Lebedev, S.A. Vinogradov, A.V. Cheprakov, Synthesis of 5,15-Diaryltetrabenzoporphyrins. *J. Org. Chem.*, **2008**, 73, 4175-4185.
2. M.A. Filatov, A.V. Cheprakov, I.P. Beletskaya, A Facile and Reliable Method for the Synthesis of Tetrabenzoporphyrins from 4,7-Dihydroisindole. *Eur. J. Org. Chem.*, **2007**, 3468-3475.
1. O.S. Finikova, A.V. Cheprakov, S.Y. Chernov, M.A. Filatov, S.A. Vinogradov, I.P. Beletskaya. Novel Synthesis of Substituted Tetraaryltetrabenzoporphyrins. *Doklady Chemistry*, **2003**, 391, 222-224.

### Book chapters

M.A. Filatov, Protection of triplet excited state materials from oxygen quenching and photooxidation in optical sensing applications *in Applications of Quenched Phosphorescence Detection of Molecular Oxygen*

*in Life Sciences*, ed. D. B. Papkovsky and R. I. Dmitriev, Royal Society of Chemistry, Cambridge, **2018**, pp. 91-116, ISBN: 978-1-78801-175-4.