

PERSONAL INFORMATION



TOFAN Daniel, Dr.

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<https://orcid.org/0000-0001-5335-1558>
<https://scholar.google.com/citations?user=5UVqp6kAAAAJ>

Nationality: Romanian

PROFESSIONAL EXPERIENCE

Present
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October 2025

Senior Lecturer (Assistant Professor)

Transylvania University of Braşov, Science and Engineering Faculty
Materials Engineering and Welding Department, 1 University Str. <https://sim.unitbv.ro>

- Teaching activities in the field of Material Science and Engineering. Instructor for courses: Material Science and Engineering, Material Science I, Advanced Material Science, Advanced Materials, Behavior of Advanced Materials under Welding
- Investigate bidimensional MX-ene materials for advanced mechanical properties and applications in the field of flexible materials.

Activity type: Academic & Research

Present
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December 2022

Research Scientist Grade III

Target Preparation Laboratory, IFIN-HH, Atomîştilor 30, Măgurele 077125, Romania

- Preparation of targets for nuclear physics experiments as isotopically enriched, to purity thin films.
- Submitted grant proposals for Romanian Ministry of Research, Innovation and Digitalization.

Activity type: Research

August 2022
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March 2022

Associate Research Scientist

PPAM Group, INFLPR, Atomîştilor 409, Măgurele 077125, Romania

- Development of LIFT (Laser-Induced Forward Transfer) techniques for heterogenous 2D materials

Activity type: Research

July 2021
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August 2018

Postdoctoral Research Fellow

Velian Research Group, Department of Chemistry, University of Washington
4000 15th Ave NE 36 Bagley Hall Seattle, WA 98195, United States of America
<https://sites.uw.edu/velian/alumni>

- Developed facile methods for chemical protection against ambient degradation of sensitive 2D semiconductors, and pyrolytic synthesis of expensive bulk semiconductors.
- Analysis of electronic nano-devices and exfoliated materials based on 2D semiconductors
- Helped establish rigorous, standardized methodology for new research group, guest-lecturer.

Activity type: Research

September 2016
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January 2015

Postdoctoral Research Fellow

Gabbai Research Group, Department of Chemistry, Texas A&M University
580 Ross St, College Station, TX 77843, United States of America.
<https://www.gabbailab.com/pastmembers>

- Demonstrated new molecular sensors for formaldehyde based on frustrated Lewis-pairs.
- Investigated CO₂ capture methods based on Lewis acids at high pressures (50 bars).
- Consulted for grant proposals, coordinated meetings, advised students on research goals.

Activity type: Research

June 2013
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October 2008

Graduate Research Assistant, Teaching Assistant

Cummins Research Group, Department of Chemistry, Massachusetts Institute of Technology (MIT)
77 Massachusetts Ave., Cambridge, MA 02139, United States of America

- Developed novel, practical methods for chemical synthesis of fundamental small molecules.
- Discovered green approaches towards the synthesis of frameworks relevant to chemical catalysis.
- Designed a recirculating photolytic reactor for highly pyrophoric chemicals (white phosphorus).
- Oversaw group meetings in place of the principal investigator, and advised undergraduate students.
- Organized scientific seminars, led recitations, taught undergraduates laboratories.

Activity type: Academic & Research

April 2008
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June 2006

Undergraduate Research Assistant, Undergraduate Teaching Assistant

Department of Chemistry and Chemical Engineering, California Institute of Technology (Caltech)
1200 E. California Blvd., Pasadena, CA 91125, United States of America

- Developed catalysts for polymerization of olefins, and molecular probes for arteriosclerotic plaques.
- Taught undergraduate laboratories.

Activity type: Academic & Research

EDUCATION

June 2013
|
August 2008

Doctor of Philosophy in Inorganic Chemistry

Massachusetts Institute of Technology (MIT), Department of Chemistry, 77 Massachusetts Ave., 18-393, Cambridge, MA 02139, United States of America.

Thesis: "From the Activation of Tetraphosphorus to the Chemistry of Diphosphorus and Beyond"
<https://dspace.mit.edu/handle/1721.1/82170>

Coordinator: Prof. Christopher C. Cummins – Henry Dreyfus Professor at MIT

May 2008
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August 2005

Bachelor of Science in Chemistry with Honors

California Institute of Technology, Department of Chemistry and Chemical Engineering, 1200 East California Boulevard, Pasadena, California 91125, United States of America.

https://campuspubs.library.caltech.edu/2146/1/commencement_2008.pdf

June 2003
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September 1999

Baccalaureate

International Computer Highschool of Bucharest (ICHB), Șos. Mihai Bravu 428, Bucharest, Romania

PERSONAL COMPETENCES

First Language
Secondary Languages

Romanian

UNDERSTANDING

Listening

Reading

SPEAKING

Spoken Interaction

Spoken Production

WRITING

English

C2

C2

C2

C2

C2

German

A2

B1

A1

A1

A1

Spanish

A1

A1

A1

A1

A1

Levels: A1/A2: Elementary - B1/B2: Independent - C1/C2: Experienced
Common European Framework of Reference for Language skills

Professional Skills

Refined critical and analytical thinking skills as a results-oriented, fast, versatile learner.

Teamwork-oriented and enthusiastic towards problem-solving within a cooperative environment.

Experienced in public speaking and delivering written assignments to a wide spectrum of audiences.

Extensive synthetic chemistry expertise for preparing materials on micro- to kilo-gram scales.

Proficient in assembly, handing, and analysis of nano-scale electronic devices.

Safe handling and disposal of highly dangerous materials, including highly pyrophoric or air-sensitive materials (glovebox and Schlenk-line techniques).

Dangerous laboratory techniques: high-power UV photolysis, oxyhydrogen flame, high-pressure reactors (200 bars), pyrolytic furnaces (1300 °C), cryogenic condensers, closed-flow systems.

Computational molecular chemistry techniques and X-ray structure refinement.

Instrumental techniques: NMR (1D, 2D, MAS; EPR); calorimetry (DSC, TGA); X-ray spectroscopy (PXRD, SCXRD, XES, XPS); chromatography (FC, LC, TLC, HPLC); absorbance/emission spectroscopy (Raman, IR, UV-vis-nIR, fluorescence); mass spectroscopy (GC-MS, MS-MS, ESI, MALDI); scanning microscopy (SEM, EDX, AFM, TEM); voltammetry (CV, DPV); nanodevice manufacture (PDMS stamp).

ADDITIONAL INFORMATION

Scientific Publications in ISI Journals

- (1) Söderström, P.-A.; Kuşoğlu, A.; **Tofan, D.**; *et al.* "Nuclear level density of ¹²⁸Te from (p, p'γ) scattering and complementary photonuclear data" *Physica Scripta*, **2025**, doi.org/10.1088/1402-4896/addaac
- (2) Coman, A.; **Tofan, D.** *et al.* "Proton inelastic scattering on ⁵⁶Fe: Insights from the 9-MV Tandem Accelerator measurements @ IFIN-HH", *Nuclear Physics A*, **2025**, 1059, p. 123080 doi.org/10.1016/j.nuclphysa.2025.123080
- (3) Söderström, P.-A.; Kuşoğlu, A.; **Tofan, D.**; *et al.* "From implementation to operation and the first measurements with the ELIGANT detectors from ELI-NP" *Nuovo Cimento della Societa Italiana di Fisica C*, **2024**, 47, 2, doi.org/10.1393/hcc/i2024-24058-3
- (4) **Tofan, D.**; Sakazaki, Y.; Walz Mitra, K.L.; Peng, R.; Lee, S.; Li, M.; Velian, A. "Surface Modification of Black Phosphorus with Group 13 Lewis Acids for Ambient Protection and Electronic Tuning," *Angew. Chem. Int. Ed.*, **2021**, 60, V.I.P., 8329–8336. doi.org/10.1002/anie.202100308
- (5) Walz Mitra, K. L.; Chang, C. H.; Hanrahan, M. P.; Yang, Y.; **Tofan, D.**; Holden, W. M.; Govind, N.; Seidler, G. T.; Rossini, A. J.; Velian, A. "Surface Functionalization of Black Phosphorus with Nitrenes: Identification of P=N Bonds by Using Isotopic Labeling," *Angew. Chem., Int. Ed.*, **2021**, 60, 9127–9134. doi.org/10.1002/anie.202016033
- (6) **Tofan, D.**; Velian, A. "Interstellar Chemistry in a Glovebox: Elusive Diatomic P≡N, Exposed," *ACS Cent. Sci.* **2020**, 6, 1485–1487. doi.org/10.1021/acscentsci.0c01148
- (7) Yang, M.; **Tofan, D.**; Chen, C.-H.; Jack, K.M.; Gabbai, F. P. "Digging the Sigma-Hole of Organoantimony Lewis Acids by Oxidation," *Angew. Chem., Int. Ed.*, **2018**, 57, 13868–13872. doi.org/10.1002/anie.201808551
- (8) Knopf, I.; **Tofan, D.**; Beetstra, D.; Al-Nezari, A.; Al-Bahilyb, K.; Cummins, C. C. "A family of *cis*-macrocyclic diphosphines: modular, stereoselective synthesis and application in catalytic CO₂/ethylene coupling," *Chem. Sci.*, **2017**, 8, 1463–1468. doi.org/10.1039/C6SC03614G
- (9) **Tofan, D.**; Gabbai, F. P. "Fluorinated antimony(V) derivatives: strong Lewis acidic properties and application to the complexation of formaldehyde in aqueous solutions," *Chem. Sci.*, **2016**, 7, 6768–6778. doi.org/10.1039/C6SC02558G
- (10) Knopf, I.; Ono, T.; Temprado, M.; **Tofan, D.**; Cummins, C. C. "Uptake of one and two molecules of CO₂ by the molybdate dianion: a soluble, molecular oxide model system for carbon dioxide fixation," *Chem. Sci.*, **2014**, 5, 1772–1776. doi.org/10.1039/C4SC00132J

- (11) Breunig, J. M.; **Tofan, D.**; Cummins, C. C. "Contrasting *cyclo*-P₃ Ligand Transfer Reactivity of Valence-Isoelectronic Aryloxide Complexes [(P₃)Nb(ODipp)₃]⁻ and [(P₃)W(ODipp)₃]," *Eur. J. Inorg. Chem., special issue*, **2014**, 2014, 1605–1609. doi.org/10.1002/ejic.201301140
- (12) Cummins, C. C.; Huang, C.; Miller, T. J.; Reintinger M. W.; Stauber, J. M.; Tannou, I.; **Tofan, D.**; Toubaei, A. I.; Velian, A.; Wu, G. "Sodium Bis(triphenylstannyl) Phosphide: Synthesis, Structural Characterization, and Reactions with Indium, Tin, and Gold Electrophiles," *Inorg. Chem.*, **2014**, 53, 3678–3687. doi.org/10.1021/ic403178j
- (13) Manna, C. M.; Nassar, M. Y.; **Tofan, D.**; Chakarawet, K.; Cummins, C. C. "Facile synthesis of mononuclear early transition-metal complexes of *κ*³*cyclo*-tetrametaphosphate ([P₄O₁₂]⁴⁻) and *cyclo*-trimetaphosphate ([P₃O₉]³⁻)," *Dalton Trans.*, **2014**, 43, 1509–1518. doi.org/10.1039/C3DT52526K
- (14) **Tofan, D.**; Temprado, M.; Majumdar, S.; Hoff, C. D.; Cummins, C. C. "Functionalization Reactions Characteristic of a Robust Bicyclic Diphosphane Framework," *Inorg. Chem.*, **2013**, 52, 8851–8864. doi.org/10.1021/ic401052a
- (15) Wang, L.-P.; **Tofan, D.**; Chen, J.; Van Voorhis, T.; Cummins, C. C. "A pathway to diphosphorus from the dissociation of photoexcited tetraphosphorus," *RSC Advances*, **2013**, 3, 23166–23171. doi.org/10.1039/C3RA43940B
- (16) Palluccio, T.; Rybak-Akimova, E.; Cai, X.; Majumdar, S.; Cai, X.; Chui, M.; Temprado, M.; Silvia, J. S.; Cozzolino, A. F.; **Tofan, D.**; Velian V.; Cummins, C.C.; Captain, B.; Hoff, C.; "Thermodynamic and Kinetic Study of Cleavage of the N–O Bond of N-Oxides by a Vanadium(III) Complex: Enhanced Oxygen Atom Transfer Reaction Rates for Adducts of Nitrous Oxide and Mesityl Nitrile Oxide," *J. Am. Chem. Soc.*, **2013**, 135, 11357–11372. doi.org/10.1021/ja405395z
- (17) **Tofan, D.**; Cummins, C. C. "Bicyclic dinuclear *tris*-(ditopic diphosphane) complexes of zerovalent group 10 metals" *Chem. Sci.*, **2012**, 3, 2474–2478. doi.org/10.1039/C2SC20559A
- (18) Cozzolino, A. F.; **Tofan, D.**; Cummins, C. C.; Temprado, M.; Palluccio, T. D.; Elena V. Rybak-Akimova, E. V.; Majumdar, S.; Cai, X.; Captain. B.; Hoff, C. D. "Two-Step Binding of O₂ to a Vanadium(III) Trisanilide Complex To Form a Non-Vanadyl Vanadium(V) Peroxo Complex," *J. Am. Chem. Soc.*, **2012**, 123, 18249–18252. doi.org/10.1021/ja309621h
- (19) Tonks, I. A; **Tofan, D.**; Weintrob, E. C.; Agapie, T.; Bercaw, J. E. "Zirconium and Titanium Propylene Polymerization Precatalysts Supported by a Fluxional C₂-Symmetric Bis(anilide)pyridine Ligand," *Organometallics*, **2012**, 31, 1965–1974. doi.org/10.1021/om201262h
- (20) **Tofan, D.**; Cossairt, B. M.; Cummins, C. C. "White Phosphorus Activation at a Metal–Phosphorus Triple Bond: a New Route to *cyclo*-Triphosphorus or *cyclo*-Pentaphosphorus Complexes of Niobium," *Inorg. Chem.*, **2011**, 50, special issue cover, 12349–12358. doi.org/10.1021/ic2014607
- (21) **Tofan, D.**; Cummins, C. C. "Photochemical Incorporation of Diphosphorus Units into Organic Molecules," *Angew. Chem., Int. Ed.*, **2010**, 49, V.I.P., 7516–7518. doi.org/10.1002/anie.201004385 (featured in *Chem. & Eng. News*, Sep. 13, 2010, p. 26, cen.acs.org/magazine/88/8837.html)
- (22) Weintrob, E. C.; **Tofan, D.**; Bercaw, J. E. "Synthesis and Characterization of Iron Derivatives Having a Pyridine-Linked Bis(anilide) Pincer Ligand," *Inorg. Chem.*, **2009**, 48, 3808–3813. doi.org/10.1021/ic900083s

(23) Chekmenev, E. Y.; Chow, S.-K; **Tofan, D.**; Weitekamp, D. P.; Ross, B. D.; Bhattacharya, P. “Fluorine-19 NMR Chemical Shift Probes Molecular Binding to Lipid Membranes,” *J. Phys. Chem. B*, **2008**, 112, 6285–6287. doi.org/10.1021/jp800646k

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Patents Agapie, T; Golisz, S. R.; **Tofan, D.**; Bercaw, J. E. “Non-metallocene organometallic complexes and related methods and systems,” *US Pat. Appl. Pub.* (**2007**) 11/859,089. *PCT Int. Appl. Pub.* (**2007**) PCT/US2007/079137. patents.google.com/patent/US7847099B2/en

Didactic Publications Daniel Tofan; Dan Cristian Cuculea; Roxana Moldovan; Cătălin Croitoru; Mircea Horia Țierean; Elena Manuela Stanciu; Alexandru Pascu; Liana Sandra Balteș „*Material Science in Engineering – Practical Applications*,” (2025), Ed. Printech, București, ISBN: 978-606-23-1644-0.

Other Publications (1) N. M. Florea, A. Radu, **D. Tofan** “Target Laboratories of the World”, *International Nuclear Targets Development Society Newsletters* (**2023**), 52, 2, 4–6. www.intds.org/newslett-archive
(2) N. M. Florea, **D. Tofan** “EURO-LABS Basic training school 2023” *International Nuclear Targets Development Society Newsletters*, (**2023**), 52, 2, 7–11. www.intds.org/newslett-archive
(3) N. M. Florea, **D. Tofan**, “Laboratoarele de la Măgurele, o Pepinieră a Minților Inovatoare”, *InHouse* (editor Romanian Ministry of Research, Inovation and Digitalization), (**2024**), 74, 41-43. www.mcid.gov.ro/comunicare-mass-media/revista-inhouse

Scientific Presentations 1st ICLPR-ST, poster, 2022, Măgurele, Romania.
261st American Chemical Society National Meeting and Exposition (ACS), online, Spring 2021.
International Online Workshop on Phosphorus Chemistry (OWPC), online, 2021.
Northwest Regional Meeting of ACS (NORM), online, 2021.
MRSEC–MEM-C Seminar Series, oral, 2020, Seattle, WA.
MEM-C Workshop Series, poster, 2019, Seattle, WA.
UW Inorganic Division Seminar Series, oral, 2018, Seattle, WA.
Gordon Research Conference on Inorganic Chemistry, poster, 2016, Biddeford, ME.
Gordon Research Seminar on Inorganic Chemistry, oral, 2016, Biddeford, ME.
251st American Chem. Society National Meeting, oral, 2016, San Diego, CA.
BASF–TAMU Symposium, poster, 2015, Texas A&M, College Station, TX.
4th Stone Symposium on Organometallic Chemistry, poster, 2015, Baylor University, Waco, TX.
MIT Chemistry Seminar Series, oral, 2013, Cambridge, MA.
MIT Inorganic Chemistry Seminar Series, oral, 2012, Cambridge, MA.
Gordon Research Symposium on Organometallic Chemistry, poster, 2012, Newport, RI.
Gordon Research Conference on Inorganic Chemistry, 2012, Biddeford, ME.
243rd American Chemistry Society National Meeting, oral, 2012, San Diego, CA.
Bruker–MIT Symposium, 2012, Cambridge, MA.
Metals in Synthesis Symposium Series, oral, 2011, MIT, Cambridge, MA.
240th American Chemical Society National Meeting, oral, 2010, Boston, MA.
18th International Conference on Phosphorus Chemistry, oral, 2010, Wroclaw, Poland.

- Honors**
- EH&S Lab Safety Award*, EH&S Division, UW (2021).
 - Special Mention*, OWPC Poster Awards (2021).
 - EH&S Safety Awards*, UW (2019).
 - Travel Fellowship Award*, Gordon Research Conferences (2016).
 - Semifinalist*, 2nd Yale Graduate Consulting Case Competition, Yale (2013).
 - EHS Innovation Award*, MIT (2012).
 - Morse Grant*, MIT (2012).
 - Chemistry Teaching Award*, MIT (2010).
 - Bachelor of Science with Honors*, Caltech (2008).
 - Summer Undergraduate Research Fellowship Scholar*, Caltech (2005, 2006, 2007).
 - Harold Lord Undergraduate Scholarship*, Caltech (2005).
 - Excellence Diploma from President of Romania* (2004).
 - Gold Medal*, 35th International Chemistry Olympiad (IChO), , Athens, Greece (2003).