

## CURRICULUM VITAE

NAME Bartosz Andrzej Grzybowski	POSITION TITLE Distinguished Professor of Chemistry, UNIST Institute for Basic Science, Group Leader Professor at the Polish Academy of Sciences
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### EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE	MTH/YR(s)	FIELD OF STUDY
Yale University, New Haven, CT	B.S.	6/1995	Chemistry
Yale University, New Haven, CT	M.Sc.	6/1995	Chemistry
Harvard University, Cambridge, MA	Ph.D.	11/2000	Chemistry

### A. Positions and Honors:

#### Professional Experience

10/2000 – 7/2001	Postdoctoral Fellow, Harvard University
7/2001 – 8/2003	Director of Research, Vitae Pharmaceuticals and Associate of the Department of Chemistry and Chemical Biology, Harvard University
7/2002 – present	Chief Scientific Officer, ProChimia Surfaces, Ltd.
9/2003 – 8/2007	Assistant Professor, Northwestern University, Department of Chemical and Biological Engineering and Department of Chemistry
9/2007 – 8/2009	Associate Professor, Northwestern University, Department of Chemical and Biological Engineering and Department of Chemistry
7/2009 – 5/2017	President of GSI, L.L.C.
9/2009 – 8/2014	Director of the DoE Energy Frontier Research Center (Non-Equilibrium Energy Research Center, Northwestern University)
9/2009 – 12/2014	Full Professor, Kenneth Burgess Chair in Physical Chemistry and Chemical Systems' Engineering, Department of Chemical and Biological Engineering and Department of Chemistry
9/2014 – present	Professor, Polish Academy of Sciences
12/2014 – present	Distinguished Professor of Chemistry, UNIST
7/2015 – present	IBS Group Leader, IBS Center for Soft and Living Matter @ UNIST

#### Honors & Awards

1995	Arthur Fleischer Award for Outstanding Performance in Chemistry, Yale University
1995	Honoris in Chimia, Yale University
1995	Summa cum Laude, Yale University
2003	Camille and Henry Dreyfus New Faculty Award
2006	National Science Foundation CAREER Award
2006	3M Non-Tenured Faculty Award
2006	Pew Scholar in the Biomedical Sciences
2006	American Chemical Society Division of Colloid and Surface Chemistry Unilever Award
2007	Sloan Fellowship
2007	Camille Dreyfus Teacher-Scholar Award

2008	G. Kanig Award for Innovation (Verband für Polymerforschung, Germany)
2010	Soft Matter Lectureship (Royal Society of Chemistry, UK)
2010	Saville Lectureship (Princeton University)
2010	Crano Distinguished Lectureship (American Chemical Society, Akron Section)
2010	American Institute of Chemical Engineers NSEF Young Investigator Award
2011	Centennial Year of Chemistry Distinguished Lecture (Wroclaw University, Poland)
2012	Excellence in Nanoscience Lectureship (EPFL, Switzerland)
2012	MESA Institute Annual Lecture (University of Twente, the Netherlands)
2012	ISIS Distinguished Lectureship (University of Strasbourg, France)
2013	Nanoscience Prize (International Society for Nanoscale Science, Computation and Engineering; <a href="http://en.wikipedia.org/wiki/International_Society_for_Nanoscale_Science,_Computation,_and_Engineering">http://en.wikipedia.org/wiki/International_Society_for_Nanoscale_Science,_Computation,_and_Engineering</a> )
2014	The Givaudan Lecture and the Bristol Synthesis Meeting
2015	Fellow of the Royal Society of Chemistry
2016	The Feynman Prize in Nanotechnology; <a href="https://en.wikipedia.org/wiki/Feynman_Prize_in_Nanotechnology">https://en.wikipedia.org/wiki/Feynman_Prize_in_Nanotechnology</a>
2018	WuXi Distinguished Lecturer (Shanghai, China)
2019	Sendzimir Honorary Medal (Society of Innovators, Poland)
2019	25 <sup>th</sup> Solvay Conference on Chemistry (Brussels, Belgium)
2019	NIH NCATS “Aspire” Award (National Institutes of Health, NIH, Washington, USA)
2020	Elected Member of the Societas Scientiarum Varsaviensis (Towarzystwo Naukowe Warszawskie)
2021	AbbVie Discovery 2021 Platform Chemistry Technology Seminar

## PART 1: SCIENTIFIC PORTFOLIO AND METRICS

**B. Current scientific interests:** computerized synthesis; artificial intelligence, AI, applied to organic chemistry, discovery of new reactions and of new drugs; AI for chemical waste management, complex chemical networks and catalytic systems, self-assembly in non-equilibrium regimes, nanomaterials for catalysis, energy storage and nanomedicine.

**C. Highlights of Scientific Contributions.** Grzybowski and his team pioneered research on non-equilibrium self-assembly processes in chemical systems (*Nature* 2000, *Science* 2002a, *Science* 2002b, *Nature* 2018, *Nature* 2020a, *Nature* 2020b). They were the first ones to describe nanoscale self-assembly based on electrostatic interactions (*Science* 2006), and first ones to demonstrate all-nanoparticle electronics (*Nature Nanotechnology* 2011, 2016, *Nature Materials* 2012). Grzybowski’s team discovered several fundamental phenomena at small scales (e.g., plastic-metals, *Science* 2007; inverse photoconductors, *Nature* 2009) and is recognized as being the pioneers of reaction-diffusion chemical systems operating in the nano- and microscopic regimes (reviewed in *Angew. Chem.* 2010 and also in Grzybowski’s textbook on the subject). In 2011, the group solved perhaps the oldest scientific question – originally posed by Thales of Miletus – as to how and why materials charge upon contact with one another (*Science* 2011, *Science* 2013). In 2013, they have demonstrated magnetic traps that unlike their optical counterparts can manipulate nanoscopic objects, *both* magnetic and non-magnetic (*Nature* 2013).

Grzybowski’s most impactful discoveries are in the area of computer-planned organic synthesis and AI for reaction and drug discovery. The Grzybowski group discovered and quantified the general laws governing the Network of Organic Synthesis (*Nature Chemistry* 2009), and created Chematica, the “chemical brain” for the planning of organic syntheses (*Angew. Chem.* 2012a, 2012b, 2012c, 2016, *Chem* 2018, 2019, 2020). In 2020,

they demonstrated how computers can plan syntheses to complex natural products (*Nature* 2020) and how they can discover new prebiotic syntheses (*Science* 2020).

Grzybowski has a strong track record of research commercialization. The companies he started has achieved a valuation of close to \$1 billion. He also advises pharma industry (e.g., Merck) and has managed a portfolio of research grants (from US, Korean and Polish governments totaling >\$40 million).

Grzybowski is an author of over 280 articles cited close ca. 20,000 times (Web of Science). Over the years, he received several awards including NSF CAREER Award, Pew Scholar in the Biomedical Sciences, American Institute of Chemical Engineers NSEF Young Investigator Award, ACS Unilever Award, Sloan Fellowship, Dreyfus Teacher-Scholar Award, Nanoscience Prize, and the 2016 Feynman Prize.

**D. Citation from the ISI Web of Science (Jan 25, 2021): total citations > 20,000; h-index = 65**

**E. Books authored.** B.A. Grzybowski “*Chemistry in Motion: Reaction-Diffusion Systems for Micro- and Nanotechnology*” Wiley, 2009, ISBN: 978-0-470-03043-1). **Reviewed in:** *Angew. Chem. Int. Ed.* **2010**, 49, No. 47, p. 8790

**F. Web of Science Publications ( \* denotes corresponding author):**

## 2021

[280] M. Kim, M. Dygas, Y.I. Sobolev, W. Beker, Q. Zhuang, T. Klucznik, G. Ahumada, J.C. Ahumada & B.A. Grzybowski\* On-nanoparticle gating units render an ordinary catalyst substrate- and site-selective. *J. Am. Chem. Soc.* (2021, in press) **IF = 14.6**

[279] K. Molga, S. Szymkuć, B.A. Grzybowski\*, Chemist Ex Machina: Advanced Synthesis Planning by Computers, *Acct. Chem. Res.* (2021, in press) **IF = 21.6 COVER ART**

[278] X. Zhao, L. Yang, J. Guo, T. Xiao, Y. Zhou, Y. Zhang, B. Tu, T. Li, B.A. Grzybowski\*, Y. Yan\* Transistors and logic circuits based on metal nanoparticles and ionic gradients. *Nature Electronics* (2021, in press)

[277] B.A. Grzybowski\* Synthetic planning, reaction discovery and design of chemical systems using computers. *Proc. 25<sup>th</sup> Solvay Conf. Chem.* (2021, in press).

## 2020

[276] B.A. Grzybowski\*, Synthesis planning, reaction discovery, and design of chemical systems using computers. Computational Modeling: From chemistry to Materials to Biology. *Proceedings Of The 25th Solvay Conference On Chemistry*, pp. 15-20 (World Scientific 2020).

[275] M. Siek, K. Kandere-Grzybowska, \* B.A. Grzybowski\* Mixed-Charge, pH-Responsive Nanoparticles for Selective Interactions with Cells, Organelles, and Bacteria. *Acc. Mater. Res.* **1**, 188–200 (2020).

[274] B. Mikulak-Klucznik, P. Gołębiowska, A.A. Bayly, O. Popik, T. Klucznik, S. Szymkuć, E.P. Gajewska, P. Dittwald, O. Staszewska-Krajewska, W. Beker, T. Badowski, K.A. Scheidt, K. Molga\*, J. Mlynarski\*, M. Mrksich\*, B.A. Grzybowski\* Computational planning of the synthesis of complex natural products. *Nature*, 588, 83-88 (2020) **IF = 42.8**

[273] O. Cybulski, M. Dygas, B. Mikulak-Klucznik, M. Siek, T. Klucznik, S.Y. Choi, R.J. Mitchell, Y.I. Sobolev, B.A. Grzybowski\* Concentric liquid reactors for chemical synthesis and separation. *Nature*, **586**, 57-63 (2020) **IF = 42.8 COVER ART**

- [272] A. Wołos, R. Roszak, A. Zadło-Dobrowolska, W. Beker, B. Mikulak-Klucznik, G. Spolnik, M. Dygas, S. Szymkuć, B.A. Grzybowski\* Synthetic connectivity, emergence, and self-regeneration in the network of prebiotic chemistry. *Science* **369**, eaaw1955 (2020) **IF = 41.8**
- [271] S. Szymkuć, E.P. Gajewska, K. Molga, A. Wołos, R. Roszak, W. Beker, M. Moskal, P. Dittwald, B.A. Grzybowski\* Computer-generated "synthetic contingency" plans at times of logistics and supply problems: scenarios for hydroxychloroquine and remdesivir. *Chem. Sci.* **11**, 6736-6744 (2020). **IF = 9.3**
- [270] W. Beker, A. Wołos, S. Szymkuć, B.A. Grzybowski\* Minimal-uncertainty prediction of general drug-likeness based on Bayesian neural networks. *Nature Machine Intelligence* **2**, 457-465 (2020).
- [269] B.A. Grzybowski, G. Gryniewicz\* Known drugs in new therapeutic indications. The case of chloroquine. *Przemysł Chemiczny* **99**, 812-815 (2020) **COVER ART**
- [268] J. Sun, Y. Sobolev, W. Zhang, Q. Zhuang, B.A. Grzybowski\* Enhancing crystal growth by stretching ionic polymers in shear flow. *Nature* **579**, 73-79 (2020) **IF = 42.8**
- [267] M. Borkowska, M. Siek, D. Kolygina, Y. Sobolev, S. Lach, K. Kandere-Grzybowska\* & B.A. Grzybowski\* Targeted crystallization of mixed-charge nanoparticles in lysosomes induces selective death of cancer cells. *Nature Nanotechnology* **15**, 331-341 (2020) **IF = 31.5 COVER ART**
- [266] Gajewska, E.P., Szymkuć, S., Dittwald, P., Startek, M., Popik, O., Mlynarski, J., Grzybowski, B.A. Algorithmic discovery of tactical combinations for advanced organic syntheses. *Chem* **6**, 280-293 (2020). **IF = 19.7**
- [265] J.H. Park, J. Paczesny, N. Kim, B.A. Grzybowski\* Shaping microcrystals of metal-organic frameworks by reaction-diffusion. *Angew. Chem. Int. Ed.* **59**, 10301-10305 (2020) **IF = 12.9**
- [264] W. Adamkiewicz, M. Siek, T. Mazur, S. Lach, B.A. Grzybowski\* Additive contact polarization of non-ferroelectric polymers for patterning of multilevel memory elements *ACS Appl. Mater. Interfaces*, **12**, 1504-1510 (2019). **IF = 8.7**

## 2019

- [263] T. Badowski, E.P. Gajewska, B.A. Grzybowski\* Synergy Between Expert and Machine Learning Approaches Allows for Improved Retrosynthetic Planning. *Angew. Chem. Int. Ed.* **59**, 725-730 (2019). **IF = 12.9 VIP PAPER**
- [262] M. Li, Bin Tu, B. Cui, X. Zhao, L. Yang, Q. Fang, Y. Yan\*, B.A. Grzybowski\* Efficient and Long-Lasting Current Rectification by Laminated Yet Separated, Oppositely Charged Monolayers, *ACS Appl. Electron. Mater.*, DOI: 10.1021/acsaelm.9b00482 (2019).
- [261] R. Roszak, W. Beker, K. Molga, B.A. Grzybowski\* Rapid and Accurate Prediction of pK(a) Values of C-H Acids Using Graph Convolutional Neural Networks. *J. Am. Chem. Soc.* **141**, 17142-17149 (2019). **IF = 14.6**
- [260] T. Lee, Y.I. Sobolev, O. Cybulski, B.A. Grzybowski\* Dynamic Assembly of Small Parts in Vortex-Vortex Traps Established within a Rotating Fluid. *Adv. Mater.* **31**, # 1902298 (2019). **IF = 27.4**
- [259] P. F. Moretti\*, B.A. Grzybowski, V. Basios, E. Fortunato, M. Suarez Diez, O. Speck, R. Martins, *BMC Materials* **1**, #3 (2019).
- [258] K. Molga, P. Dittwald, B.A. Grzybowski\* Computational design of syntheses leading to compound libraries or isotopically labelled targets. *Chem. Sci.* **10**, 9219-9232 (2019) **IF = 9.3 COVER ART**
- [257] K. Molga, E.P. Gajewska, S. Szymkuć, B.A. Grzybowski\* The logic of translating chemical knowledge into machine-processable forms: A modern playground for physical-organic chemistry. *React. Chem. Eng.* **4**, 1506-1521 (2019). **IF = 3.4**
- [256] J. Wei, Z. Yang, Y.I. Sobolev, B.A. Grzybowski\* Colloidal phagocytosis and self-propulsion mediated by stretchable and reactive membranes of MOF surfactants. *Adv. Intell. Syst.* **1**, #1900065 (2019) **COVER ART**

- [255] M. Kim, Z. Yang, J.H. Park, S.M. Yoon\* & B.A. Grzybowski\* Nanostructured rhenium-carbon composites as hydrogen-evolving catalysts effective over the entire pH range. *ACS Appl. Nano Mater.* **2**, 2725-2733 (2019).
- [254] E. Um, J.M. Oh, J. Park, T. Song, T.E. Kim, Y.J. Choi, C. Shin, D. Kolygina, J.H. Jeon, B.A. Grzybowski\* & Y.K. Cho\*, Immature dendritic cells navigate microscopic mazes to find tumor cells. *Lab Chip* **19**, 1665-1675 (2019) **IF = 6.8**
- [253] T. Badowski, K. Molga & B.A. Grzybowski\* Selection of cost-effective yet chemically diverse pathways from the networks of computer-generated retrosynthetic plans. *Chem. Sci.* **10**, 4640-4651 (2019) **IF = 9.06**
- [252] N. Kim, J. H. Park, J. Paczesny\* & B.A. Grzybowski\* Uniform and directional growth of centimeter-sized single crystals of cyclodextrin-based metal organic frameworks. *CrysEngComm* **21**, 1867-1871 (2019) **IF = 3.3**
- [251] W. Jaworski<sup>†</sup>, S. Szymkuć<sup>†</sup>, B. Mikulak-Klucznik<sup>†</sup>, K. Piecuch, T. Klucznik, M. Kaźmierowski, J. Rydzewski, A. Gambin\* & B.A. Grzybowski\* Automatic mapping of atoms across both simple and complex chemical reactions. *Nature Commun.* **10**, #1434 (2019) **IF = 12.5**
- [250] K. Molga, P. Dittwald\*, B.A. Grzybowski\* Navigating around patented routes by preserving specific motifs along computer-planned retrosynthetic pathways. *Chem* **5**, 460-473 (2019) **IF = 18.2**
- [249] O. Cybulski\*, P. Garstecki\* & B.A. Grzybowski\* Oscillating droplet trains in microfluidic networks and their suppression in blood flow. *Nature Physics* **15**, 706-713 (2019) **COVER ART IF = 22.7**
- [248] X. Zhao, Y. Zhang, Y. Yan\* & B.A. Grzybowski\* Charged metal nanoparticles for chemoelectronic circuits. *Adv. Mater.* **31**, #1804864 (2019) **IF = 25.95**
- [247] W. Beker<sup>†</sup>, E.P. Gajewska<sup>†</sup>, T. Badowski & B.A. Grzybowski\* Prediction of major regio-, site-, and diastereoisomers in Diels-Alder reactions using machine-learning: The importance of physically meaningful descriptors. *Angew. Chem. Int. Ed.* **58**, 4514-4519 (2019) **IF = 12.1**
- [246] R. Roszak, M.D. Bajczyk, E.P. Gajewska, R. Hołyst\* & B.A. Grzybowski\* Propagation of oscillating chemical signals through reaction networks. *Angew. Chem. Int. Ed.* **58**, 4520-4525 (2019) **IF = 12.1**

## 2018

- [245] X. Zhao, B. Tu, M. Li, X. Feng, Y. Zhang, Q. Fang, T. Li, B.A. Grzybowski\* & Y. Yan\* Switchable counterion gradients around charged metallic nanoparticles enable reception of radio waves. *Science Advances*, **4**, #eaau3546 (2018) **IF = 11.51**
- [244] M. Siek, W. Adamkiewicz, Y.I. Sobolev & B.A. Grzybowski\* The influence of distant substrates on the outcome of contact electrification. *Angew. Chem. Int. Ed.* **57**, 15379-15383 (2018) **IF = 12.1**
- [243] Q. Zhuang, Z. Yang, Y.I. Sobolev, W. Beker, J. Kong\* & B.A. Grzybowski\* Control and switching of charge-selective catalysis on nanoparticles by counterions. *ACS Catalysis* **8**, 7469-7474 (2018) **IF = 11.38**
- [242] S. Huda, B. Weigelin, K. Wolf, K.V. Tretiakov, K. Polev, G. Wilk, M. Iwasa, F.S. Emami, J.W. Narojczyk, M. Banaszak, S. Soh, D. Pilans, A. Vahid, M. Makurath, P. Friedl, G.G. Borisy, K. Kandere-Grzybowska\* & B.A. Grzybowski\* Lévy walks of metastatic cancer cells revealed in microfabricated systems and implicated *in vivo*. *Nature Commun.* **9**, #4539 (2018) **IF = 13.2**
- [241] M. Woźniak, A. Wołos, U. Modrzyk, R.L. Górski, J. Winkowski, M. Bajczyk, S. Szymkuć & B.A. Grzybowski\* & M. Eder\* Linguistic measures of chemical diversity and chemical keywords in natural products, drugs, and libraries of small molecules. *Sci. Rep.* **8**, #7598 (2018) **IF = 4.12**
- [240] B.A. Grzybowski\*, S. Szymkuć, E.P. Gajewska, K. Molga, P. Dittwald, A. Wołos & T. Klucznik, Chematica: A story of computer code that started to think like a chemist. *Chem* **4**, 390-398 (2018) **IF = 14.1**
- [239] T. Klucznik, M. P. McCormack, B. Mikulak, H. Lima, S. Szymkuć, M. Bhowmick, K. Molga, L. Rickershauser, E.P. Gajewska, A. Toutchkine, P. Dittwald, M.P. Startek, G.J. Kirkovits, R. Roszak, A. Adamski, S.L.J. Trice\* & B.A. Grzybowski\* Syntheses of medicinally-relevant molecules planned by computer and executed in the laboratory. *Chem* **4**, 522-532 (2018) **COVER ART IF = 14.1**

- [238] M.D. Bajczyk, P. Dittwald, A. Wołos, S. Szymkuć & B.A. Grzybowski\* Discovery and enumeration of organic-chemical and biomimetic reaction cycles within the Network of Chemistry. *Angew. Chem. Int. Ed.* **57**, 2367-2371 (2018) **VIP Article IF = 12.1**
- [237] Z. Yang, J. Wei, Y. Sobolev & B.A. Grzybowski\* Dynamic and mechanized assemblies of droplets powered by multiresponsive nanosurfactants. *Nature* **553**, 313-318 (2018) **IF = 41.57**
- [236] L. Belding, B. Baytekin, T. Baytekin, P. Rothmund, M.S. Verma, A. Nemiroski, B.A. Grzybowski & G.M. Whitesides\* Slit tubes for semi-soft pneumatic actuators, *Adv. Mater.* **30**, #1704446 (2018). **IF = 21.95**
- [235] B. Baytekin\*, S.D. Cezan, H.T. Baytekin\* & B.A. Grzybowski\* Plant-inspired robots: Artificial heliotropism and nyctinasty based on optomechanical feedback and no electronics. *Soft Robotics* **5**, 93-98 (2018) **IF = 8.6**

## 2017

- [234] J.H. Park, S. Lach, K. Polev, S. Granick & B.A. Grzybowski\* Metal-organic framework “swimmers” with energy-efficient autonomous motility, *ACS Nano* **11**, 10914-10923 (2017). **IF = 13.94**
- [233] T. Mazur, S. Lach & B.A. Grzybowski\*, Heterogeneous catalysis “on demand”: Mechanically controlled catalytic activity of a metal surface, *ACS Appl. Mater. Interfaces* **9**, 44264-44269 (2017). **IF = 7.5**
- [232] Z. Yang, J. Wei, K. Giżynski, M.-G. Song & B.A. Grzybowski\*, Interference-like patterns of static magnetic fields imprinted into polymer/nanoparticle composites. *Nature Commun.* **8**, #1564 (2017). **IF ~ 12.12**
- [231] Y.K. Jeong, Y.M. Lee, J. Yun, T. Mazur, M. Kim, Y.J. Kim, M. Dygas, S. Choi, K.S. Kim, O.H. Kwon, S.M. Yoon\* & B.A. Grzybowski\* Tunable photoluminescence across the visible spectrum and photocatalytic activity of mixed-valence rhenium oxide single nanoparticles. *J. Am. Chem. Soc.* **139**, 15088-15093 (2017). **IF = 13.86**
- [230] T. Lee, K. Giżynski, & B.A. Grzybowski\* Non-equilibrium self-assembly of mono- and multicomponent tubular structures in rotating fluids. *Adv. Mater.* **29**, #1704274 (2017) **IF = 19.79**
- [229] B.A. Grzybowski\*, S. Szymkuć, K. Molga, E.P. Gajewska, A. Wołos, Synthetic design with the Chematica Program – The importance of accurate rules and of higher order logic. *Chimia* **71**, 512 (2017) **IF ~ 0.9**
- [228] J. Zhang, B.A. Grzybowki & S. Granick\*, Janus particle synthesis, assembly, and application. *Langmuir* **33**, 6964-6977 (2017). **IF ~ 3.9**
- [227] G. Skoraczyński, P. Dittwald, B. Miasojedow, S. Szymkuć, E.P. Gajewska, B.A. Grzybowski\* & A. Gambin\*, Predicting the outcomes of organic reactions via machine learning: are current descriptors sufficient? *Sci. Rep.* **7**, #3582 (2017) **IF ~ 4.2**
- [226] J. Zhang, E. Luijten, B.A. Grzybowski, S. Granick\*, Jan Paczesny & Steve Granick, Active colloids with collective mobility status and research opportunities. *Chem. Soc. Rev.* **46**, 5551-5569 (2017) **IF = 38.16**
- [225] B.A. Grzybowski\*, K. Fitzner\*, Jan Paczesny & Steve Granick, From dynamic self-assembly to networked chemical systems. *Chem. Soc. Rev.* DOI: **46**, 5647-5678 (2017) **IF = 38.16**
- [224] K. Giżynski, T. Lee & B.A. Grzybowski\* Dynamic self-assembly of magnetic/polymer composites in rotating frames of reference, *Adv. Mater.* **29**, #1700614 (2017) **IF = 19.79**
- [223] K. Kandere-Grzybowska\* & B.A. Grzybowski\*, Nanosystems: Programmed communication. *Nature Nanotech.* **12**, 291-292 (2017) **IF = 38.1**
- [222] J.V. Timonen & B.A. Grzybowski\*, Tweezing of Magnetic and Non-Magnetic Objects with Magnetic Fields. *Adv. Mater.* **29**, #1603516 (2017) **IF = 19.79**
- [221] S.M. Yoon\*, J.H. Park & B.A. Grzybowski\* Large-Area, Freestanding MOF Films of Planar, Curvilinear, or Micropatterned Topographies. *Angew. Chem. Int. Ed.* **56**, 127-132 (2017) **IF = 11.9**
- [220] T. Mazur & B.A. Grzybowski\*, Theoretical basis for the stabilization of charges by radicals on electrified polymers. *Chem. Sci.* **8**, 2025-2032 (2017) **IF = 8.601**
- [219] J.V. Timonen, C. Raimondo, D. Pilans, P.P. Pillai & B.A. Grzybowski\* Trapping, manipulation, and crystallization of live cells using magnetofluidic tweezers. *Nanoscale Horiz.* **2**, 50-54 (2017) **IF = 9.39**



## 2016

- [218] S. Lach, S. M. Yoon & B. A. Grzybowski\*, Tactic, reactive, and functional droplets outside of equilibrium. *Chem. Soc. Rev.* **17**, 4766-4796 (2016) **IF = 33.383**
- [217] B. Pillai, B. Kowalczyk & B. A. Grzybowski\*, Determination of surface compositions of mixed-charge nanoparticles using electrostatic titrations. *Angew Chem. Int. Ed.* **55**, 8610–8614 (2016) **IF = 12.1**
- [216] J. Timonen, A.F. Demirors & B. A. Grzybowski\*, Magnetofluidic Tweezing of Non-Magnetic Colloids. *Adv. Mater.* **28**, 3453–3459 (2016) **COVER ART IF = 17.493**
- [215] B. A. Grzybowski\* & W.T.S. Huck\*, Nanotechnology of Life-Inspired Systems. *Nature Nanotech.* **11**, 585-592 (2016) **IF = 34.04**
- [214] Y. Yang, S.C. Warren, P. Fuller & B. A. Grzybowski\*, Chemoelectronic circuits based on metal nanoparticles. *Nature Nanotech.* **11**, 603-608 (2016) **COVER ART IF = 34.04**
- [213] S. Szymkuc, E. Gajewska, T. Klucznik, K. Molga, P. Dittwald, M. Startek, M. Bajczyk & B.A. Grzybowski\*, Computer-assisted organic synthesis: The end of the beginning. *Angew Chem. Int. Ed.* **55**, 5904-5937 (2016) **COVER ART IF = 12.1**
- [212] P. Pillai, B. Kowalczyk & B. A. Grzybowski\*, Self-assembly of like-charged nanoparticles into microscopic crystals. *Nanoscale* **8**, 157-161 (2016) **IF = 7.394**
- [211] P. Pillai, B. Kowalczyk, W. Pudlo & B. A. Grzybowski\*, Electrostatic Titrations Reveal Surface Compositions of Mixed, On-Nanoparticle Monolayers Comprising Positively and Negatively Charged Ligands. *J. Phys. Chem. C* **7**, 4139-4144 (2016) **IF = 4.772**

## 2015

- [210] S. Han, S.C. Warren, S.M. Yoon, C.D. Malliakas, X. Hou, Y. Wei, M.G. Kanatzidis & B. A. Grzybowski\*, Tunneling electrical connection in the interior of metal-organic frameworks, *J. Am. Chem. Soc.* **137**, 8169-8175 (2015) **IF = 11.444**
- [209] F. Emami, A. Vahid, L. Wylie, S. Szymkuc, P. Dittwald, K. Molga & B. A. Grzybowski\*, A priori estimation of the yields of organic reactions, *Angew Chem. Int. Ed.* **127**, 10947-10951 (2015) **IF = 11.336**
- [208] T.M. Hermans, P.S. Stewart & B.A. Grzybowski\* A pH-oscillator stretched in space but frozen in time, *J. Phys. Chem. Lett.* **6**, 760-766 (2015). **IF = 6.687**
- [207] H.T. Baytekin, B. Baytekin, S. Huda & B. A. Grzybowski\*, Chemical activation of an adhesive surface towards nanoparticle seeding and growth by mechanical pulling, *J. Am. Chem. Soc.* **137**, 1726-1729 (2015) **IF = 11.444**
- [206] T.M. Hermans, P.S. Stewart, S.H. Davis & B.A. Grzybowski\* Vortex flows can separate chiral objects via chirality-specific lift forces, *Nature Commun.* **6**, #5640 (2015) **IF = 10.742**

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#### **From B.Sc./M.Sc. Studies at Yale:**

- [1] Q.G. Zhang, P. Dupre, B.A. Grzybowski, & P.H. Vaccaro\* Laser induced fluorescence studies of jet-cooled S<sub>2</sub>O -- axis switching and predissociation effects, *J. Chem. Phys.* **103**, 67-79, (1995) **IF = 3.164**

#### **G. Other Scientific Publications (not peer-reviewed).**

4. B. A. Grzybowski, *Soft Matter* **5**, 1109 (2008)
3. B. A. Grzybowski, *Nature* **455**, 1153 (2008),
2. B. A. Grzybowski, Nanoionics – Engineering Nanostructured Crystals from Charged Nanoparticles, *Science at Stake*, [www.scienceatstake.com](http://www.scienceatstake.com), May 8 (2006)
1. B. A. Grzybowski, Crawling cells: How to stop cancer, *Polityka*, **45** (2529), 87, 2005.



## PART 2. PROFESSIONAL SERVICE

### H. Editorial:

*Soft Matter*, RSC, member of the Scientific Advisory Board (2008 - present)  
Guest Editor, *Soft Matter*, RSC, Special Issue on Self-Assembly (March, 2009)  
Guest Editor, *Chem. Commun*, RSC, Special Issue on Chemical Systems (2014)  
*Advanced Material Interfaces*, Wiley, Executive Advisory Board (June 2013-present)  
*ACS Advanced Materials and Interfaces*, ACS, member of the Scientific Advisory Board (Nov. 2013 - 2014)  
*ChemSystemsChem*, Wiley, Scientific Advisory Board (since Sept. 2018)  
*Matter*, Cell Press, Scientific Advisory Board (since Sept. 2018)

### I. Invited Lectures:

1. NECSI International Conference on Complex Systems (Nashua, NH, 2000)
2. Politechnika Gdanska (Poland, 2001)
3. Freiburg University (Germany, 2002)
4. EMBL Heidelberg (Germany, 2002)
5. European Workshop on Morphology of Surfaces and Interfaces in Soft Matter (Jadwisin, Poland 2003)
6. Moscow State University (Russia, 2003)
7. AIChE Annual Meeting, San Francisco (2003)
8. University of Munster (Germany, 2004)
9. Brown University (2004)
10. Volkswagen Conference on Complexity (Germany, 2005)
11. EPA Workshop on Self-Assembly (Cincinnati, 2005)
12. International Conference on the Technologies of the 21<sup>st</sup> Century, Moscow (2005)
13. Stanford University (2005)
14. NICO Launch Seminar (Northwestern, 2005)
15. Halliburton, Inc. (2005)
16. MATNON'05 International Conference on Nonlinear Systems (Kyoto, Japan, 2005)
17. Workshop on Stochastic Effects in Liesegang Patterns Formation (Sils-Maria, Switzerland, 2006)
18. ACS Colloid and Surface Science Symposium (Boulder, 2006)
19. Gordon Research Conference on Non-Linear Chemistry (Oxford, England, 2006)
20. Lehigh University (2006)
21. Illinois Institute of Technology, Chemistry Department (2006)
22. ACS Annual Meeting, San Francisco (2006)
23. NSF US-Poland Workshop on Nanotechnology (Poznan, Poland, 2006)
24. Dow Chemical (2006)
25. 3M (2006)
26. NIH/NCI Nanotechnology in Cancer Research, Investigators Meeting (San Diego, 2006)
27. Yale University (Chemical Engineering, 2007)
28. Keystone Symposium, Nanotechnology in Biomedicine (Tahoe City, 2007)
29. Pew Scholars Meeting (Mexico, 2007)
30. International Conference on Bioinspired Engineering (Dead Sea, Israel, 2007)
31. Freie Universitat Berlin (Chemistry, 2007)
32. ACS Annual Meeting, Chicago, PMSE Symposium (Chicago, 2007)
33. ACS Annual Meeting, Chicago, Colloidal Atoms Symposium (Chicago, 2007)
34. ACS Annual Meeting, Chicago, George Whitesides Symposium (Chicago, 2007)

35. ACS Colloids Meeting, keynote lecture (University of Delaware, 2007)
36. Gordon Conference on Thin Films and Crystal Growth (Mt. Holyoke College, 2007)
37. RPI, Dept. of Chemical Engineering (Troy, 2007)
38. US-Japan Symposium on Coordination Chemistry (Evanston, 2007)
39. Argonne National Laboratory User's Meeting (Argonne, 2007)
40. University of Wisconsin, Materials Science Colloquium (2007)
41. Northwestern University, Materials Science Colloquium (2007)
42. Harvard University, Department of Chemistry (2007)
43. PATFOR07 Symposium, Dresden, Germany (2007)
44. NIH/NCI Nanotechnology in Cancer Research, Investigators Meeting (Rayleigh, 2007)
45. ACS Annual Meeting, Symposium on Nonlinear Effects in Polymer Science (New Orleans, 2008)
46. ACS Annual Meeting, Symposium on Nanostructured Materials (New Orleans, 2008)
47. University of California at Berkeley, Department of Chemistry (2008).
48. ACS Colloids Meeting, keynote lecture (2008).
49. Electrostatics Society of America, keynote lecture (2008).
50. Symposium on Printed Functional Materials (Ireland, 2008)
51. US-Poland NSF Workshop on Nanostructured Materials (Poland, 2008)
52. Argonne National Laboratory User's Meeting (Argonne, 2008)
53. Polydays 2008 (Berlin, Germany)
54. MRS Annual Meeting (Cambridge, MA, 2008)
55. 5<sup>th</sup> International Conference on Functional Materials, FMMA 2008, Lvov, the Ukraine (2008)
56. DARPA Infochemistry Meeting (Boston, 2008)
57. University of North Carolina (Rayleigh, 2008)
58. American Society of Cell Biology, Annual Meeting (San Francisco, 2008)
59. American Physical Society (Annual Meeting, Pittsburgh, 2009)
60. University of Toronto (Canada, 2009)
61. MRS Fall National Meeting (Boston, 2009)
62. Argonne National Laboratory, Division of Materials Science (Argonne, 2009)
63. The 3<sup>rd</sup> US-Poland Workshop (Poland, 2010)
64. 4<sup>th</sup> Soft Matter Focus Conference (Schwarzwald, Germany, 2010)
65. BBC radio weekly science show (2010)
66. Gordon Conference on Chemical Oscillations and Dynamic Instabilities in Chemical Systems (Ciocco, Italy 2010)
67. Gordon Conference on Metal Nanoparticles, (Mt. Holyoke, US 2010)
68. MRS Fall Meeting (Boston, 2010)
69. Technical University of Eindhoven (the Netherlands, 2010)
70. University of Nijmegen (the Netherlands, 2010)
71. Princeton University (2010)
72. University of Akron (2010)
73. National Center of Nanotechnology (Beijing, China, 2010)
74. Complexity Workshop (Argonne, 2010)
75. AGH, Academy of Mines (Krakow, Poland 2010)
76. Adam Mickiewicz University (Poznan, Poland 2010)
77. University of Texas at Austin (2011)
78. ISACS 5 - Challenges in Chemical Biology, (Manchester, July 2011)
79. Self-Assembly on all Scales (Freiburg, Germany 2011)
80. Workshop on Self-organization in Biological Systems, Argonne National Labs (2011)
81. Gordon Research Conference on Macromolecular Chemistry (Il Ciocco, Italy 2011)
82. NSF Nanotechnology Workshop (Univ. of Wisconsin, 2011)
83. Faraday Discussion #159 (Plenary Lecture, Leeds, UK, 2012)
84. Chemistry Centennial Lecture, Wroclaw, Poland (2011)

85. Gordon Research Conference on the Physics and Chemistry of Fluids (2011, Keynote Lecture)
86. TTI Vanguard Technology Conference Series (lecture to the top US. Government Officials and CTO's of major global companies)
87. Pennsylvania State University (Chem. Eng. 2011)
88. Rensselaer Polytechnic Institute (Materials Science, 2011)
89. Electrostatics Society of America, plenary lecture (2011).
90. ACS Colloids Meeting (Keynote Lecture, 2012)
91. US-Poland NSF Workshop (Poznan, 2012)
92. Ostwald Colloquium (Plenary Lecture, Berlin 2012)
93. Workshop on Chemical Self-Organization (Leiden, Holland, 2012)
94. Bristol Science Colloquium (University of Bristol, UK, 2012)
95. Honors Week Lecture (Kent State University, 2012)
96. University of Warsaw (Poland, 2012)
97. MITRE (Washington, DC, 2012)
98. National Academy of Sciences, Committee on Physics and Astronomy (2012)
99. John Hopkins University (Chemical Engineering, 2012)
100. University of, Maryland (Chemistry, 2012)
101. Penn State (Chemical Engineering, 2012)
102. Harvard University (Origins of Life Initiative, 2012)
103. University of Nijmegen (Chemistry, 2012)
104. University of Groningen (Chemistry, 2012)
105. University of Strasbourg (Chemistry, 2012)
106. University of Strasbourg (Physics, 2012)
107. Schlumberger (Annual Meeting, 2012)
108. DTRA Senior Leadership (invited presentation, Northwestern University, 2012)
109. AIChE Annual Meeting (keynote lecture, Pittsburgh, 2012)
110. 21<sup>st</sup> Conference on Current Trends in Computational Chemistry (Jackson, MI, 2012)
111. Tulane University (Chemistry, 2013)
112. UC Irvine (Chemistry, 2013)
113. The Foresight Technical Conference (Palo Alto, CA, 2013)
114. Spring ACS National Meeting (keynote lecture, Colloid and Surface Chemistry, New Orleans, 2013)
115. MRS Spring Meeting (keynote lecture, Nanoparticle Manufacturing, Functionalization, Assembly and Integration, San Francisco, 2013)
116. Ecole Supérieure de Chimie et Physique Industrielle (Paris, France, 2013)
117. Polish Chemical Society Annual Meeting (plenary lecture, Pulawy, Poland, 2013)
118. International Conference on Mechanochemistry (plenary lecture, Lochow, Poland, 2013)
119. Freie Universität Berlin (Berlin, Germany, 2013)
120. University of Warsaw (Poland, 2014)
121. Institute of Physical Chemistry, Polish Academy of Sciences (Poland, 2014)
122. Defense Science and Research Committee/DARPA, Mesoscale Materials and Systems Workshop (Washington, D.C., January 2014)
123. TopTechnika (Warsaw University of Technology, march 2014)
124. Bristol Synthesis Symposium (Plenary Lecture, University of Bristol, UK, April 2014).
125. Gordon Research Conference on Metal Nanoparticles (Plenary Lecture, June 2014)
126. Gordon Research Conference on Chemical Oscillations and Instabilities (Spain, July 2014)
127. US-Poland NSF Workshop (Warsaw, June 2014)
128. CNRS Summer School on Nanoscience (keynote lecture, Paris, June 2014)
128. Workshop on "Programmable Functional Materials" (Urbana-Champaign, May, 2014)
129. 30th European Conference on Surface Science, ECOSS-30 (Turkey, August 2014)
130. ACS National Meeting, Symposium on "Supramolecular Nanoparticles" (keynote lecture, August 2014)
131. Sigma-Aldrich (Milwaukee, WI, 2014)

132. Ecole Normal Supérieur, Paris, France (June 2014)
133. New York University, Dept. of Chemistry (November 2014)
134. Conference on Dynamic Interfacial Phenomena (Muenster, Germany, April 2015)
135. CEZAMAT Conference on New Technologies (Warsaw, Poland, April 2015)
136. Conference on Systems Chemistry (Rolduc, Holland, May 2015)
137. Institute Curie (Paris, France, June 2015).
138. Annual Meeting of the Korean Chemical Society (2015)
139. Annual Meeting of the Polymers Society of Korea (2015)
140. MicroTAS International Conference (keynote talk, Korea 2015)
141. ACS Fall Meeting (Boston, 2015)
142. MRS Fall Meeting (Boston, 2015)
143. University of Leipzig (Leipzig, Germany, 2016)
144. Academy of Mines, AGH (Krakow, Poland, 2016)
145. Jagellonian University, Dept. of Physics (Krakow, Poland, 2016)
146. DARPA Make-It Meeting (Washington, DC, August 2016)
147. Korean Chemical Society Annual Meeting (“Dynamic nanoscale surfactants”; keynote, April 2017)
148. Swiss Chemical Society Freiburger Symposium (“Chematica: An in silico organic chemist”; Freiburg, May 8, 2017)
149. Jagellonian University, Dept. of Chemistry, “The New Opening Symposium” (“Chematica: An in silico organic chemist”; plenary, Krakow, June 23, 2017)
150. DARPA Make-It Meeting (“Chematica: An in silico organic chemist”; Washington, DC, April 27, 2017)
151. Bilkent (“Dynamic nanosurfactants at interfaces”; University Dept. of Chemistry, Ankara, Turkey, May 9, 2017)
152. UNIST Chemistry Colloquium (“Chematica: An in silico organic chemist”; Ulsan, April 2017)
153. NanoTR (“Nanoions: Charged nanoparticles for materials and nanomedicine”; plenary lecture, Antalya, Turkey, October 18, 2017)
154. Radboud University (“From computer-assisted retrosynthesis to chemical systems”; Dept. of Chemistry, Nijmegen, the Netherlands, September 19, 2017)
155. NIH NCATS 2017 Automated Chemical Synthesis Workshop (“Chematica: An in silico organic chemist”; October 20, 2017)
156. Rice University (IBB Innovator Lectures, January 19 & 22, 2018)
157. Osaka University (21<sup>st</sup> SANKEN International Symposium, January 17, 2018)
158. Kyoto University (Dept. of Chemistry, Kyoto, January, 15 2018)
159. DARPA Make-It Meeting (Washington, DC, January 23, 2018)
160. NIH NCATS (Rockville, MD, January 24, 2017)
161. Institute of Organic Chemistry, PAS (Warsaw, January 30, 2018)
162. Max Planck Institute for Colloids and Interfaces (Berlin/Golm, February 8, 2018)
163. WuXi Chemicals (Shanghai, May 2018)
164. Fudan University (Shanghai, May 2018)
165. Strong Korea Forum (Seoul, June 2018)
166. Boehringer-Ingelheim (Biberach, Germany, June 2018)
167. Bayer Pharma (Wuppertal, Germany, June 2018)
168. Bayer Pharma (Berlin, Germany, June 2018)
169. ACS National Meeting (Boston, August 2018)
170. DARPA Make-It Meeting (Boston, August, 2018)
171. Samsung Future Tech Forum (Seoul, September 2018)
172. CNR Foresight Meeting (Rome, Italy, December 2018)
173. Osaka University, Sanken Symposium (January 2019)
174. RIKEN, Wako (Japan, January 2019)
175. East Chem Conference (May 2019, Norwich, England)
176. 25<sup>th</sup> Solvay Conference on Chemistry (October 2019, Brussels, Belgium)

177. Japan's Society for Synthetic Chemistry (October 2019, Tokyo, Japan)
178. Kyoto University (October 2019, Kyoto, Japan)
179. 2<sup>nd</sup> Alpine Winter Conference on Medicinal Chemistry (Plenary Lecture, January 2020, St. Anton, Austria)
180. NSF Molecule Maker Lab Institute (University of Illinois, Urbana Champaign, Oct. 2020; by Web)
181. John Hopkins University (Origins of Life Initiative, Oct. 2020; by Web)
182. Chem/Elsevier-Reaxys Symposium (Plenary Lecture, Oct. 2020, by Web).
183. IBM Zurich (Oct. 2020, by Web)
184. AbbVie Discovery 2021 Platform Chemistry Technology Seminar (2021, to be scheduled)