Biborka Boga

Personal information

Date and place of birth: Institutional e-mail address: biborka.boga@ubbcluj.ro Nationalities: Hungarian and Romanian
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Current position	**Research Associate** at Babeș-Bolyai University (Cluj-Napoca, Romania)
Research experience	▪ Preparation of titanium-based and WO_3-based catalysts (hydrothermal crystallization, sol-gel autoignition method, wet impregnation, Au photodeposition) for photocatalytic and catalytic applications ▪ Experimental design (e.g., Box-Behnken), implementation of empirical models (polynomial regression, Artificial Neural Network Models) for the design of the catalysts ▪ Assessment of photocatalytic CO_2 reduction activity of $SrTiO_3$-based catalysts ▪ Establishment of structure-function correlations ▪ Experimental and numerical characterization (ANSYS Fluent) of the multiphase flow in falling film microreactor prototype. ▪ Kinetic modeling of degradation of active pharmaceutical ingredients in falling film microreactor.
Education	**Ph.D. Studies in Chemical Engineering** (27.09.2021- ongoing) ***Babeș-Bolyai University*** (Cluj-Napoca, Romania) in collaboration with ***Leibniz Institute for Catalysis*** (LIKAT, Rostock, Germany) ***Technical University of Dortmund*** (Dortmund, Germany) **Within the European Doctorate Internship** PhD topic: "Design of Titanium-Based Catalysts for Photocatalytic Applications. Flow and Kinetic Studies in a Multichannel Falling Film Micro-Photoreactor" **M.Sc.** in **Advanced Chemical Process Engineering** (2019-2021) ***Babeș-Bolyai University*** - Cluj-Napoca, Romania MSc topic: "Optimization of $CaTiO_3$ Photocatalytic Activity *via* Polynomial Regression and Artificial Neural Network Models in Association to the Assessment of Photoreactor Design Parameters" Graduated Summa Cum Laude (2021) **B.Sc.** in **(Bio)Chemical Engineering** (2015-2019) ***Babes-Bolyai University***, *Cluj-Napoca, Romania* BSc Topic: "Preparation and Characterization of Biocomposites Based on Reaction Center Protein and WO_3" Graduated Summa Cum Laude (2019) **High School**: ″Baróti Szabó Dávid″ (2011-2015), Mathematics-Informatics
Languages	Mother language: Hungarian Romanian (C1, Baccalaureate, 2015) English (First Certificate of English – level B2 – 2014) German (B1)
Communicational skills, team spirit	Working with international research groups within the European Doctorate Internship: • Leibniz Institute for Catalysis (01.03.2023-30.08.2023) • Technical University of Dortmund (01.09.2022-28.02.2023) Flexibility, adaptability. Concise and brief communication of ideas, clear presentation, assertiveness in communication

Organizational skills	Self-organization: own research, own topic I can adapt easily to any challenging situation (e.g., scheduling certain tasks)
Awarded research grants during the PhD studies	• "**Fellowship for the Establishment of (Inter)national Collaborations**" **provided by Leibniz Institute for Catalysis (01.09.2022-30.08.2023, Dortmund & Rostock, Germany):** *"Modeling, Design and Control of Falling Film Microreactors for Photocatalytic Applications"* – Supervisors from the host institutions: Prof. Dr.-Ing. Norbert Kockmann (TU Dortmund University), Prof. Dr. Jennifer Strunk (TUM & LIKAT), Dr. Norbert Steinfeldt (LIKAT) • **"MOE Fellowship" provided by DBU (Deutsche Bundesstiftung Umwelt) (LIKAT, Rostock, Germany) –** Supervisors from the host institutions: Prof. Dr. Jennifer Strunk and Dr. Norbert Steinfeldt
Awards	• **Best Paper Award** provided by the Academy of Romanian Scientists, Applications of Chemistry in Nanosciences and Biomaterials Engineering, Online, 22nd-24th of November 2023 • **Green Chemistry Poster Prize** issued by the Royal Society of Chemistry – 11th European Conference on Solar Chemistry and Photocatalysis: Environmental Applications, Torino, Italy, 6th – 10th of June 2022 • **1st Prize (Oral Presentation)** – 22nd Technical Scientific Conference for Students, online (08.05.2021) • **2nd (Poster) Prize**– 26th International Conference on Chemistry, online, 30.10.2020 • **Distinction for Performance in Scientific Research** issued by Academic Performance College, Babes-Bolyai University, 30.06.2018 • **Excellentia Prize** awarded by Babes-Bolyai University (30.05.2018) • **Award Certificate** – 15th International Conference Students for Students, Cluj-Napoca, Romania, 22.04.2018 • **1st Prize (Oral Presentation)** – 18th Technical Scientific Conference for Students, Timisoara, Romania, 29.04.2017
Scholarships	• "Márton Áron College" provided by Hungarian Ministry of Trade and Affairs (01.09.2020-30.06.2024) • "Szülőföld" scholarship provided by Tempus Foundation, supported by the Hungarian Ministry of Trade and Affairs, for the 2022-2023 academic year • "Szekely Forerunner Research Fellowship" provided by the Forerunner Federation (2021) • "Special Scholarship for funding Scientific Research Activities" - provided by Babeș-Bolyai University (2019-2020 academic year) • "Márton Áron Scholarship for Gifted Youngsters" funded by the Hungarian Ministry of Economic and Foreign Affairs during the 2017-2018 academic years
Digital competences	MATLAB, Minitab, ANSYS Fluent, Origin, Microsoft Office
Hobbies, free time activities	• Volunteering (Open days -Faculty of Chemistry and Chemical Engineering– 2015, 2017, Nature Protection – March of 2021– Ajton) • Reading (Stefanie Stahl, Wielfred Nelles, Gabor Mate, Irvin Yalom), Spending time in nature, Wandering, Sports, Travelling
Conferences	Participation with poster (9 conferences), with oral presentation (8 conferences), 1 colloquium Recently attended selected conferences/colloquiums: ▪ **57. Jahrestreffen Deutscher Katalytiker (57. KAT)** (13-15.03.2024, Weimar, Germany) B. Boga, N. G. Moustakas, P. Naliwajko, T. Peppel, A. Hezam, V.-M. Cristea, N. Steinfeldt, J. Strunk, Role of $SrCO_3$ in $SrTiO_3$-$SrCO_3$-Based Materials for Photocatalytic CO_2 Reduction - **Poster** ▪ **Applications of Chemistry in Nanosciences and Biomaterials Engineering** (22nd-24th of November 2023, Online) – B. Boga, K. Baur, V.-M. Cristea, N. Steinfeldt, N. Kockmann, Flow and Kinetic Studies of Photocatalytic Ciprofloxacin Degradation in a Falling Film Microreactor. ▪ **15th European Congress on Catalysis** (27.08.-01.09.2023, Prague, Czech Republic) B. Boga, N. G. Moustakas, P. Naliwajko, A. B. Ngo, S. Ding, T. Peppel, N. Steinfeldt, V. M. Cristea, J. Strunk, The Design of New $SrTiO_3$-based Catalysts for Photocatalytic CO_2 Reduction Applications - **Oral Presentation** ▪ **US-German Workshop Series on Artificial Photosynthesis** (04.06.2023, online) – B. Boga, N. G. Moustakas, T. Peppel, A. Hezam, A. Springer, S. Ding, A.B. Ngo, V.M. Cristea, N. Steinfeldt, The Influence of Photodeposited Gold and/or

Impregnated NiO Nanoparticles on the Photocatalytic CO_2 Reduction of $SrTiO_3$-$SrCO_3$– **Poster**

- **LIKAT Colloquium – Data Science in Catalysis** (13.12.**2022**, Rostock, Germany) B. Boga, V. M. Cristea, J. Strunk, Machine Learning Algorithms Aiming the Enhancement of the Photocatalytic Performance of Perovskites – **Oral Presentation**
- **11th European Conference on Solar Chemistry and Photocatalysis: Environmental Applications** (**11. SPEA**) (06-10.06.2022, Torino, Italy) B. Boga, N. Steinfeldt, I. Medic, N. Moustakas, H. Lund, V.-M. Cristea, Z. Pap, J. Strunk, The Development of Novel $SrTiO_3$-based Catalysts for Photocatalytic Applications. (Green Chemistry Poster Prize Issued by the Royal Society of Chemistry) – **Poster**
- **55. Jahrestreffen Deutscher Katalytiker (55. KAT)** (27-29.06.2022, Weimar, Germany) B. Boga, N. Steinfeldt, V.-M. Cristea, F. Lorenz, I. Szekely, T. Gyulavari, Z. Pap, J. Strunk, Correlation Between Hydrothermal Synthesis Conditions – Morpho-Structural Peculiarities – Photocatalytic Efficiency of $CaTiO_3$ and $SrTiO_3$ - **Poster**

Publication list (at international scientific journals)

Bíborka Boga, Kevin Baur, Vasile-Mircea Cristea, Norbert Steinfeldt, and Norbert Kockmann, Experimental and numerical investigations of flow behavior in an open falling film microreactor equipped with curved flow splitting elements, *Chemical Engineering Science*, **2024**, 120338. (IF = 4.7) (DOI: 10.1016/j.ces.2024.120338)

Bíborka Boga, Nikolaos G. Moustakas, Yunyan Han, Haijun Jiao, Carsten Kreyenschulte, Pawel Naliwajko, Thi Thanh Hoa Duong ,Shuoping Ding, Anh Binh Ngo, Abdo Hezam, Tim Peppel, Vasile-Mircea Cristea, Norbert Steinfeldt, Design of $SrTiO_3$-based catalysts for photocatalytic CO_2 reduction, *Catalysis Science & Technology*, **2024** (IF=5) (DOI: 10.1039/d4cy00313f)

Bíborka Boga, Vasile-Mircea Cristea, István Székely, Felix Lorenz, Tamás Gyulavári, Lucian Cristian Pop, Lucian Baia, Zsolt Pap, Norbert Steinfeldt, Jennifer Strunk, Experimental data-driven and phenomenological modelling approaches targeting the enhancement of $CaTiO_3$ photocatalytic efficiency, *Sustainable Chemistry and Pharmacy*, **2023**, 33, 101045 (IF=6, DOI: 10.1016/j.scp.2023.101045

Bíborka Boga, Norbert Steinfeldt, Nikolaos G. Moustakas, Tim Peppel, Henrik Lund, Jabor Rabeah, Zsolt Pap Vasile Mircea Cristea, Jennifer Strunk, Role of $SrCO_3$ on photocatalytic performance of $SrTiO_3$-$SrCO_3$ composites, *Catalysts*, **2022**, 12(9), 978 (IF=4.2,doi: 10.3390/catal12090978)

Bíborka Boga, István Székely, Monica Focșan, Monica Baia, Tibor Szabó, László Nagy, Zsolt Pap, Sensor surface *via* inspiration from nature: the specific case of electron trapping in $TiO_2/WO_3(\cdot 0.33H_2O)$ and reaction center/$WO_3(\cdot 0.33H_2O)$ systems, *Applied Surface Science*, **2022**, 572, 151139 (IF=6.7, DOI: 10.1016/j.apsusc.2021.151139)

István Székely, Monica Baia, Klára Magyari, Bíborka Boga, Zsolt Pap, The effect of the pH adjustment upon the WO_3-$WO_3 \cdot 0.33H_2O$-TiO_2 ternary composite systems' photocatalytic activity, *Applied Surface Science*, **2019**, 490, 469-480, (IF=6.7, doi: 10.1016/j.apsusc.2019.06.036)

Bíborka Boga, István Székely, Zsolt Pap, Lucian Baia, Monica Baia, Detailed spectroscopic and structural analysis of TiO_2/WO_3 composite semiconductors, *Journal of Spectroscopy*, **2018**, 2018 (IF=1.75, DOI: 10.1155/2018/6260458)

Cumulative impact factor: 35.5

Publication(s) in progress of submission

Bíborka Boga, Kevin Baur, Elisabeta-Cristina Timiș, Henrik Lund, Tim Peppel, Vasile-Mircea Cristea, Norbert Kockmann, Norbert Steinfeldt, Photocatalytic antibiotic degradation in coated open microchannels by applying 2D and 3D flow modeling with kinetics, *Journal of Environmental Chemical Engineering*

**Attached documents: Selected awards*

Location, date: Cluj-Napoca, 19.06.2024 

THE ACADEMY OF ROMANIAN SCIENTISTS

Best Paper Award

This award is proudly presented to

Bíborka Boga, Kevin Baur, Vasile-Mircea Cristea, Norbert Steinfeldt, Norbert Kockmann

for the paper "**Flow and Kinetic Studies of Photocatalytic Ciprofloxacin Degradation in a Falling Film Microreactor**" presented at the International Scientific Conference *„Applications of Chemistry in Nanosciences and Biomaterials Engineering"*.

ECATERINA ANDRONESCU

22 - 24 November 2023

ROYAL SOCIETY OF CHEMISTRY

Green Chemistry

This is to certify that

Boga Biborka

has been awarded a

***Green Chemistry* Poster Prize at**

11th European Conference on Solar Chemistry and Photocatalysis: Environmental Applications (SPEA11)

6th – 10th June 2022

Philip Jessop
Editorial Board Chair
Green Chemistry
Queen's University, Canada

Michael A Rowan

Executive Editor
Green Chemistry

English:

Excellentia Award

Boga Biborka

It is awarded the Excellentia Award by Students' Council of Babeș-Bolyai University, in recognition and appreciation of the outstanding academic performance, for proven involvement and dedication in the academic community.

"Education is the most powerful weapon which you can use to change the world" – Nelson Mandela

Prefect of students, illegible signature