Recognitions of Nick Serpone FROM Research.com

- 2025 - Research.com Chemistry in Italy Leader Award
- 2022 - Research.com Chemistry in Italy Leader Award
- 2010 - Member of the European Academy of Sciences

Overview

Nick Serpone is affiliated with the University of Pavia in Italy and specializes in Materials Science, with a focus on Materials Chemistry, Renewable Energy, Sustainability and the Environment, Organic Chemistry, Electrical and Electronic Engineering, and Mechanical Engineering. Their research encompasses a variety of topics including Advanced Photocatalysis Techniques, Microwave-Assisted Synthesis and Applications, Perovskite Materials and Applications, Quantum Dots Synthesis and Properties, Carbon and Quantum Dots Applications, Multicomponent Synthesis of Heterocycles, and Epoxy Resin Curing Processes.

Serpone has contributed to several scientific publications in notable venues, with frequent publications in:

- Photochemical & Photobiological Sciences
- Molecules
- Journal of Oleo Science
- RSC Advances
- Chemistry - A European Journal

Among the recent papers authored or co-authored by Serpone are:

- "Sunscreens and their usefulness: have we made any progress in the last two decades?", 2021, Photochemical & Photobiological Sciences

Other notable recent works from Serpone's field of collaboration, though led by other authors, include:

- "Photoluminescent Carbon Quantum Dots: Synthetic Approaches and Photophysical Properties", 2021, Chemistry - A European Journal
- "Application of Variable Frequency Microwaves in Microwave-Assisted Chemistry: Relevance and Suppression of Arc Discharges on Conductive Catalysts", 2020, Catalysts
- "Luminescent monodispersed carbon quantum dots by a microwave solvothermal method toward bioimaging applications", 2021, Journal of Photochemistry and Photobiology A Chemistry
- "Revisiting the BaBiO3 semiconductor photocatalyst: synthesis, characterization, electronic structure, and photocatalytic activity", 2021, Photochemical & Photobiological Sciences

Frequent co-authors collaborating with Serpone include:

Satoshi Horikoshi, V. K. Ryabchuk, Aida V. Rudakova, D. S. Shtarev, Alexei V. Emeline

Nick Serpone was recognized with the distinction of Fellow of the European Academy of Sciences in 2010.

Best Publications

- **Photocatalyzed destruction of water contaminants,** David F. Ollis; Ezio Pelizzetti; Nick Serpone. **1932 Citations**
- **Size Effects on the Photophysical Properties of Colloidal Anatase TiO2 Particles: Size Quantization versus Direct Transitions in This Indirect Semiconductor?,** N. Serpone; D. Lawless; R. Khairutdinov; **1754 Citations**
- **Photocatalysis: Fundamentals and Applications,** Ezio Pelizzetti; Nick Serpone; **1690 Citations**
- **Is the Band Gap of Pristine TiO_2 Narrowed by Anion- and Cation-Doping of Titanium Dioxide in Second-Generation Photocatalysts?** Nick Serpone; **1240 Citations**
- **Photoassisted Degradation of Dye Pollutants. V. Self-Photosensitized Oxidative Transformation of Rhodamine B under Visible Light Irradiation in Aqueous TiO_2 Dispersions,** Taixing Wu;Guangming Liu;Jincai Zhao;Hisao Hidaka; **1209 Citations**
- **Kinetics studies in heterogeneous photocatalysis. I. Photocatalytic degradation of chlorinated phenols in aerated aqueous solutions over titania supported on a glass matrix,** Hussain Al-Ekabi; Nick Serpone; **907 Citations**
- **Charge Carrier Trapping and Recombination Dynamics in Small Semiconductor Particles.** G. Rothenberger; J. Moser; M. Graetzel ; N. Serpone; **899 Citations**
- **Inorganic and organic UV filters: Their role and efficacy in sunscreens and suncare products,** Nick Serpone; Daniele Dondi; Angelo Albini; **818 Citations**
- **Semiconductor Photocatalysis - Past, Present, and Future Outlook.** N. Serpone; A. V. Emeline; **808 Citations**
- **Chemical oxidation and DNA damage catalysed by inorganic sunscreen ingredients.** Rosemary Dunford; Angela Salinaro; Lezhen Cai; Nick Serpone; **737 Citations**
- **Exploiting the interparticle electron transfer process in the photocatalysed oxidation of phenol, 2-chlorophenol and pentachlorophenol: chemical evidence for electron and hole transfer between coupled semiconductors,** N. Serpone; P. Maruthamuthu; P. Pichat; E. Pelizzetti; **689 Citations**
- **Photooxidative N-demethylation of methylene blue in aqueous TiO_2 dispersions under UV irradiation,** Tianyong Zhang; Toshiyuki Oyama; Akio Aoshima; Hisao Hidaka; **683 Citations**
- **TiO_2-assisted photodegradation of dye pollutants : II. Adsorption and degradation kinetics of eosin in TiO_2 dispersions under visible light irradiation,** Fenglei Zhang; Jincai Zhao; Tao Shen; Hisao Hidaka; Nick Serpone; **605 Citations**
- **Subnanosecond Relaxation Dynamics in TiO_2 Colloidal Sols (Particle Sizes Rp = 1.0-13.4 nm). Relevance to Heterogeneous Photocatalysis,** N. Serpone; D. Lawless; R. Khairutdinov; Ezio Pelizzetti; **598 Citations**

- **Spectroscopic, Photoconductivity, and Photocatalytic Studies of TiO_2 Colloids: Naked and with the Lattice Doped with Cr^{3+}, Fe^{3+}, and V^{5+} Cations,** Nick Serpone; Darren Lawless; Jean Disdier; Jean-Marie Herrmann; **592 Citations**

- **Photoassisted Degradation of Dye Pollutants. 3. Degradation of the Cationic Dye Rhodamine B in Aqueous Anionic Surfactant/TiO_2 Dispersions under Visible Light Irradiation: Evidence for the Need of Substrate Adsorption on TiO_2 Particles,** Jincai Zhao; Taixing Wu; Kaiqun Wu; Kyoko Oikawa; Nick Serpone; **577 Citations**

- **Role of hydroxyl radicals and trapped holes in photocatalysis. A pulse radiolysis study,** D. Lawless; N. Serpone; D. Meisel; **541 Citations**

- **Photosensitized degradation of dyes in polyoxometalate solutions versus TiO_2 dispersions under visible-light irradiation: mechanistic implications,** Chuncheng Chen; Wei Zhao; Pengxiang Lei; Jincai Zhao; Nick Serpone; **426 Citations**

- **Glossary of terms used in photocatalysis and radiation catalysis (IUPAC Recommendations 2011),** Silvia E. Braslavsky; André M. Braun; Alberto E. Cassano; Alexei V. Emeline,…and Nick Serpone; **425 Citations**

- **Chemical degradation of chlorophenols with Fenton's reagent (Fe^{2+} + H_2O_2),** Massimo Barbeni; Claudio Minero; Ezio Pelizzetti; Enrico Borgarello; Nick Serpone; **400 Citations**

RESEARCH PRODUCTIVITY OF NICK SERPONE FROM 2022 TO FEBRUARY 25, 2026

CHAPTERS IN BOOKS

- 53. Nick Serpone and Satoshi Horikoshi, On the Concepts of a Circular Economy and Sustainable Development Goals (SDGs), in Satoshi Horikoshi and Nick Serpone (Eds), ***Electromagnetic Wave Innovations for Sustainability I: Foundation and Energy Production***, Volume 1 , Springer Nature, Singapore, **2026**.
- 52. Satoshi Horikoshi and Nick Serpone, Green Chemistry, in Satoshi Horikoshi and Nick Serpone (Eds), ***Electromagnetic Wave Innovations for Sustainability I: Foundation and Energy Production***, Volume 1 , Springer Nature, Singapore, **2026**.
- 51. A.V. Emeline, A.V. Rudakova, R.V. Mikhaylov, D.W. Bahnemann, and Nick Serpone, Fundamentals of Photocatalysis and Emerging Applications, in Satoshi Horikoshi and Nick Serpone (Eds), ***Electromagnetic Wave Innovations for Sustainability I: Foundation and Energy Production***, Volume 1 , Springer Nature, Singapore, **2026**.
- 50. Vladimir Ryabchuk, Vyacheslav Kuznetsov, Galina Kataeva, Dmitrii Shtarev, Aleksandra Bardakova, Dmitrii Zharovov, and Nick Serpone, Evolution of Photocatalysis in Sustainability Science, in Satoshi Horikoshi and Nick Serpone (Eds), ***Electromagnetic Wave Innovations for Sustainability I: Foundation and Energy Production***, Volume 1 , Springer Nature, Singapore, **2026**.
- 49. Satoshi Horikoshi and Nick Serpone Historical Overview of Microwave Technologies for Environmental Cleanup and Microwave Electrodeless Discharge Lamps, in Satoshi Horikoshi and Nick Serpone (Eds), ***Electromagnetic Wave Innovations for Sustainability II: Applications***, Volume 2, Springer Nature, Singapore, **2026**.

- 48. Satoshi Horikoshi and Nick Serpone, Photocatalysis / Microwave hybrid method for Wastewater Treatments, in Satoshi Horikoshi and Nick Serpone (Eds), ***Electromagnetic Wave Innovations for Sustainability II: Applications***, Volume 2, Springer Nature, Singapore, **2026**.
- 47. Satoshi Horikoshi and Nick Serpone, Designing Self-Degrading Polymeric Materials with Expiration Dates for Sustainable Plastic Management using Photocatalysts, in Satoshi Horikoshi and Nick Serpone (Eds), ***Electromagnetic Wave Innovations for Sustainability II: Applications***, Volume 2, Springer Nature, Singapore, **2026**.
- 46. Satoshi Horikoshi and Nick Serpone, Resource recovery through rapid decomposition of E-waste using microwaves, in Satoshi Horikoshi and Nick Serpone (Eds), ***Electromagnetic Wave Innovations for Sustainability II: Applications***, Volume 2, Springer Nature, Singapore, **2026**.
- 45. Nick Serpone and Satoshi Horikoshi, Production and Storage of Hydrogen Enhanced by Microwave Radiation, in Satoshi Horikoshi and Nick Serpone (Eds), ***Electromagnetic Wave Innovations for Sustainability II: Applications***, Volume 2, Springer Nature, Singapore, **2026**.
- 44. Satoshi Horikoshi and Nick Serpone, Microwave-induced in-Liquid Plasma Method and Its Application to Water Treatment, in Satoshi Horikoshi and Nick Serpone (Eds), ***Electromagnetic Wave Innovations for Sustainability II: Applications***, Volume 2, Springer Nature, Singapore, **2026**.
- 43. S. Horikoshi and **N. Serpone**, Role of Microwaves in Heterogeneous Catalysis, in *Advances in Microwave-assisted Heterogeneous Catalysis*, J. Hu and B. M. Reddy (Eds.), Catalysis Series No. 45, Royal Society of Chemistry, London, UK, **2024**, Chapter 2.
- 42. S. Protti and **N. Serpone**, Multidisciplinary Approaches to Solar-driven Water Splitting and Carbon Dioxide Conversion, in ***Recent Developments in Functional Materials for Artificial Photosynthesis***, S. Ghosh and Q. Wang (Eds.), Royal Society of Chemistry, UK, March **2023**; https://DOI:10.1039/9781839167768-00157
- 41. Satoshi Horikoshi and **Nick Serpone**, Novel Ingenious and High-Quality Utilization of Microwave High Energy in Chemical Reactions: Heterogeneous Microscopic Heating, Promoted Electron Transfer by Electromagnetic Wave Energy, and Generation of In-Liquid Plasma. In *High-Energy Chemistry and Processing in Liquids*, Y. Ishikawa et al. (eds.), Chapter 13, Springer Nature, Singapore Pte Ltd. **2022**; https://doi.org/10.1007/978-981-16-7798-4_13
- 40. Horikoshi S., **Serpone N**. (**2022**) Microwave Thermal and Nonthermal Processes. In: Horikoshi S., Brodie G., Takaki K., **Serpone N**. (eds) ***Agritech: Innovative Agriculture Using Microwaves and Plasmas***. Springer, Singapore. https://doi.org/10.1007/978-981-16-3891-6_1
- 39. Horikoshi S., Suzuki N., **Serpone N**. (**2022**) Improvement and Effective Growth of Plants' Environmental Stress Tolerance on Exposure to Microwave Electromagnetic Wave Effects. In: Horikoshi S., Brodie G., Takaki K., **Serpone N**. (eds) ***Agritech: Innovative Agriculture Using Microwaves and Plasmas***. Springer, Singapore. https://doi.org/10.1007/978-981-16-3891-6_5
- 38. Horikoshi S., **Serpone N**. (**2022**). Stimulating the Aging of Beef with Microwaves. In: Horikoshi S., Brodie G., Takaki K., **Serpone N**. (eds) ***Agritech: Innovative Agriculture Using Microwaves and Plasmas*.** Springer, Singapore. https://doi.org/10.1007/978-981-16-3891-6_7
- 37. Emeline A.V., Rudakova A.V., Mikhaylov R.V., Ryabchuk V.K., **Serpone N**. Electron transfer processes in heterostructured photocatalysts, in: Bahnemann D., Patrocinio A.O.T. (Eds) Springer ***Handbook of Inorganic Photochemistry***, Springer International Publishing, Switzerland, **2022**. https://doi.org/10.1007/978-3-030-63713-2

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- ***14.*** Satoshi Horikoshi, José M. Catalá-Civera, Robert F. Schiffmann, Jun Fukushima, Tomohiko Mitani, and **Nick Serpone, *Microwave chemical and materials processing: A tutorial*,** 2nd edition, Springer, Singapore (October **2024**).
- ***15.*** Satoshi Horikoshi and Nick Serpone, ***Electromagnetic Wave Innovations for Sustainability I: Foundation and Energy Production***, Volume 1 , Springer Nature, Singapore **2026**.
- ***16.*** Satoshi Horikoshi and Nick Serpone, ***Electromagnetic Wave Innovations for Sustainability II: Recycling and Environmental Remediation,*** Volume 2, Springer Nature, Singapore **2026**.
- ***17***. Nick Serpone and Leonardo Palmisano, ***Chemistry Foundations – Understanding Fundamentals and Principles***, Springer Nature, Switzerland (Textbook; **2026**).

Recent published Articles

2026

- F519. Vyacheslav N Kuznetsov, Yuri Chizhov, Nadezhda Glazkova, Galina Kataeva, Ruslan Mikhaylov, Vladimir K Ryabchuk, Alexei Emeline, and **Nick Serpone**, Manifestation of excitonic resonance in diffuse reflectance spectra of halide perovskites, *Physical Chemistry Chemical Physics*, **28**, 662-670 (2026); https://doi.org/10.1039/D5CP03576G

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- F518. S Horikoshi, S Kawasako, and **N Serpone**, Pulsed microwave-induced growth enhancement of *Euglena gracilis* microalgae – Approach for improved industrial cultivation, *Journal of Oleo Science,* **74**, 1047-1055 (2025).
- F517. S Horikoshi, K Hirota, and **N. Serpone**, Proposal for self-degrading power cables incorporating graphitic carbon nitride to address electronic waste challenges and evaluation of decomposition efficiencies, *Molecules,* **30(19),** 3951 (2025).
- F516. Yukie Yokota, Nazuna Itabashi, Mari Kawaguchi, Hiroshi Uchida, **Nick Serpone,** and Satoshi Horikoshi, Inhibiting *Escherichia coli* Growth by Optimized Low-Power Microwave Irradiation – Delivery of Ag and Au Nanoparticles, *Molecules,* **30**, 1871 (2025)
- F515. Satoshi Horikoshi, Ken Matsumoto, Megumi Nakamura, and **Nick Serpone**, Microwave-Induced In-Liquid Plasma in Chemical and Environmental Applications. IV. Proposed novel treatment to decontaminate wastewater polluted by microplastics and toxic metal ions, *Journal of Oleo Science,* **74**, 949-959 (2025).
- F514. S. Horikoshi, T. Mitani, and **N. Serpone**, Exploring Efficient and Energy-Saving Microwave Chemical and Material Processes Using Amplitude-Modulated Waves: Pd-Catalyzed Reaction and Ag Nanoparticle Synthesis, *Molecules*, **30**, 598 (2025).
  (**Invited article**, Special Issue "Research in Heterogeneous Catalysis – 2nd edition").
- F513. Vyacheslav N. Kuznetsov, Yuri V. Chizhov, Nadezhda I. Glazkova, Ruslan V. Mikhaylov, Vladimir K. Ryabchuk, Alexei V. Emeline, and **Nick Serpone**, Origin of the Absorption Edge Fine Structure in Pb-Based Organic-Inorganic 1D Perovskites, *Phys. Chem. Chem. Phys.,* **27**, 13534-13542 (2025).

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- F512. Satoshi Horikoshi, Naoki Hachisuga, and **Nick Serpone**, Recycling of e-waste power cables using microwave-induced pyrolysis – process characteristics and facile recovery of copper metal, *RSC Adv*., **2024**, *14*, 29955–29964. https://DOI:10.1039/d4ra05602g .
- R511 Satoshi Horikoshi and **Nick Serpone**, Role of Microwaves in *Green Hydrogen* Production and Storage, *Energy and Fuels,* **38(24),** 23281–23298 (2024); https://doi.org/10.1021/acs.energyfuels.4c04522 (**Invited article**).

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- F510. Satoshi Horikoshi, Haruka Mura, and **Nick Serpone**, Three-dimensional observations of the electric field distribution of variable frequency microwaves, and scaling-up organic syntheses, *Commun. Chem.*, **6**, 261 (2023) . https://doi.org/10.1038/s42004-023-01062-6
- F509. V.N. Kuznetsov, Y.V. Chizhov, N.I. Glazkova, R.V. Mikhaylov, N.I. Selivanov, V.K. Ryabchuk, and **N. Serpone**, Absorption Edge Fine Structure in the $PyPbI_3$ Perovskite Revealed by Variable-Temperature UV−Vis Diffuse Reflectance Spectroscopy, *J. Phys. Chem. C,* **127,** 17085–17095 (2023) ; https://doi.org/10.1021/acs.jpcc.3c02828
- R508. G. Sportelli, T. Boselli, S. Protti, **N. Serpone**, and D. Ravelli, Photovoltaic Materials as Heterogeneous Photocatalysts: A Golden Opportunity for Sustainable Organic Syntheses, *Solar RRL,* **7**, 2201008 (2023).

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- F507. Satoshi Horikoshi, Yuhei Arai, Haruka Mura, and **Nick Serpone**, Curing an epoxy adhesive with fixed frequency microwaves in the presence of a microwave absorber (activated carbon) and by the variable frequency microwave method, *Journal of Applied Polymer Sciences*, e53010 (2022) . https://doi.org/10.1002/app.53010
- F506. S Horikoshi, M Iwabuchi, M Kawaguchi, S Yasumasu, and **N Serpone**, Uptake of nanoparticles from sunscreen physical filters into cells arising from increased environmental microwave radiation: increased potential risk of the use of sunscreens to human health, *Photochemical & Photobiological Sciences*, 1-13 (2022) .
- F505. S Horikoshi, H Tanizawa, A Sawai, and **N Serpone**, Low-temperature microwave-driven thermos-chemical generation of hydrogen from steam reforming of alcohols over magnetite, *International Journal of Hydrogen Energy* **47 (56),** 23520-23529 (2022).
- F504. S Horikoshi, M Kimura, **N Serpone**, Development of a microwave-discharge light-emitting diode (MDLED): a novel UV source for the UV-driven microwave-assisted TiO_2 photocatalytic treatment of contaminated wastewaters, *Photochemical & Photobiological Sciences* **21(5),** 659-665 (2022)
- R503. D.S. Shtarev and **N. Serpone**, A New Generation Of Visible-Light-Active Photo-Catalysts – The Alkaline Earth Metal Bismuthates: Syntheses, Compositions, Structures, And Properties, *Journal of Photochemistry and Photobiology C: Photochemistry Reviews,* 100501 (2022).
- F502. A.V. Emeline, A.V. Rudakova, V.K. Ryabchuk, and **N. Serpone**, Recent advances in composite and heterostructured photoactive materials for the photochemical conversion of solar energy, *Current Opinion in Green and Sustainable Chemistry,* 100588 (2022).