

## The 2021 *ES&T* Best Paper Awards: Nevertheless, We Persisted



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The truth is that there are many ways that we go about identifying the best papers of the year. Over each of the past 60 years, *ES&T* has surveyed the landscape of the scientific and technological publications that it has had the privilege to host in this journal and has used many criteria, including creativity, rigor, insight, novelty, and many more. Often, one key criterion that distinguishes the many excellent papers that *ES&T* publishes from those that are selected as being in the category of “Best” is relevance. Relevance to particular emerging pollutants, contaminants, policies, regions, or concerns of the day can be one important factor in making this determination.

And so today, I think it is important to put our process of selecting the “2021 Best Paper Awards” in context. When reflecting on the past two-plus years, it would be nearly impossible to overstate how many times that the word “unprecedented” has been used to reflect on the historical events that have taken place. Facing the COVID pandemic, war, political conflict, environmental catastrophe, a mental health epidemic, and other challenges, society has had to figure out how to cope; how to survive. The members of our *ES&T* community are no different than the rest of the world, and while not everyone in the world is touched equally, everyone is impacted somehow, often having to deal with painful circumstances we could not have imagined five years ago.

Nevertheless, we persisted.

Few things have made me more proud to be the Editor-in-Chief of *ES&T* than seeing how our community coped—no, triumphed—over the past years of difficulty. The community through mutual support, understanding, compassionate collaboration, and countless acts of individual empathy rose to overcome the challenges, the “unprecedented” challenges, and to persist in our mutual sacred goal of preserving, protecting, and defending the environment and human health and advancing sustainability.

And so this year’s Best Paper Awards for papers published in 2021 are special, because those that receive the recognition represent not only their own unique brilliance in presenting some of the best novel, impactful new research but also something more, the resilience, determination, and humanity of the *ES&T* community.

The Executive Editors at *ES&T* thank the dedicated team of *ES&T* associate editors and members of our Editorial Advisory Board and Early Career Advisory Board team for their vital and valued contributions to the selection of the 2021 *ES&T* Best Paper Awards.

### ENVIRONMENTAL SCIENCE

**First Joint Winner.** Alain Manceau, Anne-Claire Gaillot, Pieter Glatzel, Yves Cherel, and Paco Bustamante. In Vivo Formation of HgSe Nanoparticles and Hg–Tetrathiolate Complex from Methylmercury in Seabirds—Implications for the Hg–Se Antagonism. *Environ. Sci. Technol.* 2021, 55 (3), pp 1515–1526. <https://pubs.acs.org/doi/10.1021/acs.est.0c06269>.

**Second Joint Winner.** Aolin Wang, Dimitri Panagopoulos Abrahamsson, Ting Jiang, Miaomiao Wang, Rachel Morello-Frosch, June-Soo Park, Marina Sirota, and Tracey J. Woodruff. Suspect Screening, Prioritization, and Confirmation of Environmental Chemicals in Maternal-Newborn Pairs from San Francisco. *Environ. Sci. Technol.* 2021, 55 (8), pp 5037–5049. <https://pubs.acs.org/doi/10.1021/acs.est.0c05984>.

**Third Joint Winner.** Charles N. Lowe, Katherine A. Phillips, Kristin A. Favela, Alice Y. Yau, John F. Wambaugh, Jon R. Sobus, Antony J. Williams, Ashley J. Pfirman, and Kristin K. Isaacs. Chemical Characterization of Recycled Consumer Products Using Suspect Screening Analysis. *Environ. Sci. Technol.* 2021, 55 (16), pp 11375–11387. <https://pubs.acs.org/doi/10.1021/acs.est.1c01907>.

**First Joint Runner-Up.** Guomao Zheng, Erika Schreder, Jennifer C. Dempsey, Nancy Uding, Valerie Chu, Gabriel Andres, Sheela Sathyanarayana, and Amina Salamova. Per- and Polyfluoroalkyl Substances (PFAS) in Breast Milk: Concerning Trends for Current-Use PFAS. *Environ. Sci. Technol.* 2021, 55 (11), pp 7510–7520. <https://pubs.acs.org/doi/10.1021/acs.est.0c06978>.

**Second Joint Runner-Up.** Eun Kyung Lee, Xiaobo Xue Romeiko, Wangjian Zhang, Beth J. Feingold, Haider A. Khwaja, Xuesong Zhang, and Shao Lin. Residential Proximity to Biorefinery Sources of Air Pollution and Respiratory Diseases in New York State. *Environ. Sci. Technol.* 2021, 55 (14), pp 10035–10045. <https://pubs.acs.org/doi/10.1021/acs.est.1c00698>.

### ENVIRONMENTAL TECHNOLOGY

**First Joint Winner.** Yongguang Bu, Hongchao Li, Wenjing Yu, Yifan Pan, Lijun Li, Yanfeng Wang, Liangtao Pu, Jie Ding, Guandao Gao, and Bingcai Pan. Peroxydisulfate Activation and

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Singlet Oxygen Generation by Oxygen Vacancy for Degradation of Contaminants. *Environ. Sci. Technol.* **2021**, *55* (3), pp 2110–2120. <https://pubs.acs.org/doi/10.1021/acs.est.0c07274>.

**Second Joint Winner.** Wensi Chen, Ting Wang, Zeou Dou, and Xing Xie. Self-Driven Pretreatment and Room-Temperature Storage of Water Samples for Virus Detection Using Enhanced Porous Superabsorbent Polymer Beads. *Environ. Sci. Technol.* **2021**, *55* (20), pp 14059–14068. <https://pubs.acs.org/doi/10.1021/acs.est.1c03414>.

**Third Joint Winner.** Jia Xie, Zhipeng Liao, Ming Zhang, Linhan Ni, Junwen Qi, Chaohai Wang, Xiuyun Sun, Lianjun Wang, Shaobin Wang, and Jiansheng Li. Sequential Ultrafiltration-Catalysis Membrane for Excellent Removal of Multiple Pollutants in Water. *Environ. Sci. Technol.* **2021**, *55* (4), pp 2652–2661. <https://pubs.acs.org/doi/10.1021/acs.est.0c07418>.

**First Joint Runner-Up.** Kun Qian, Hong Chen, Wenlang Li, Zhimin Ao, Yi-nan Wu, and Xiaohong Guan. Single-Atom Fe Catalyst Outperforms Its Homogeneous Counterpart for Activating Peroxymonosulfate to Achieve Effective Degradation of Organic Contaminants. *Environ. Sci. Technol.* **2021**, *55* (10), pp 7034–7043. <https://pubs.acs.org/doi/10.1021/acs.est.0c08805>.

**Second Joint Runner-Up.** Chi Wang, Meng Sun, Yumeng Zhao, Mingxin Huo, Xianze Wang, and Menachem Elimelech. Photoelectrochemical Osmotic System Enables Simultaneous Metal Recovery and Electricity Generation from Wastewater. *Environ. Sci. Technol.* **2021**, *55* (1), pp 604–613. <https://pubs.acs.org/doi/10.1021/acs.est.0c04375>.

## ■ POLICY ANALYSIS

**First Joint Winner.** Fan Tong, Alan Jenn, Derek Wolfson, Corinne D. Scown, and Maximilian Auffhammer. Health and Climate Impacts from Long-Haul Truck Electrification. *Environ. Sci. Technol.* **2021**, *55* (13), pp 8514–8523. <https://pubs.acs.org/doi/10.1021/acs.est.1c01273>.

**Second Joint Winner.** Daniel Raimi, Alan J. Krupnick, Jih-Shyang Shah, and Alexandra Thompson. Decommissioning Orphaned and Abandoned Oil and Gas Wells: New Estimates and Cost Drivers. *Environ. Sci. Technol.* **2021**, *55* (15), pp 10224–10230. <https://pubs.acs.org/doi/10.1021/acs.est.1c02234>.

**Third Joint Winner.** He He and Rupert J. Myers. Log Mean Divisia Index Decomposition Analysis of the Demand for Building Materials: Application to Concrete, Dwellings, and the U.K. *Environ. Sci. Technol.* **2021**, *55* (5), pp 2767–2778. <https://pubs.acs.org/doi/10.1021/acs.est.0c02387>.

**First Joint Runner-Up.** Sheldon V. Masters, Tyler C. Bradley, Gary A. Burlingame, Chad J. Seidel, Maureen Schmelling, and Timothy A. Bartrand. What Can Utilities Expect from New Lead Fifth-Liter Sampling Based on Historic First-Draw Data? *Environ. Sci. Technol.* **2021**, *55* (17), pp 11491–11500. <https://pubs.acs.org/doi/10.1021/acs.est.1c00421>.

**Second Joint Runner-Up.** Peter Berrill, Kenneth T. Gillingham, and Edgar G. Hertwich. Linking Housing Policy, Housing Typology, and Residential Energy Demand in the United States. *Environ. Sci. Technol.* **2021**, *55* (4), pp 2224–2233. <https://pubs.acs.org/doi/10.1021/acs.est.0c05696>.

## ■ CRITICAL REVIEW

**First Joint Winner.** Haley E. Plaas and Hans W. Paerl. Toxic Cyanobacteria: A Growing Threat to Water and Air Quality. *Environ. Sci. Technol.* **2021**, *55* (1), pp 44–64. <https://pubs.acs.org/doi/10.1021/acs.est.0c06653>.

**Second Joint Winner.** Clara M. A. Eichler, Elaine A. Cohen Hubal, Ying Xu, Jianping Cao, Chenyang Bi, Charles J. Weschler, Tunga Salthammer, Glenn C. Morrison, Antti Joonas Koivisto, Yinping Zhang, Corinne Mandin, Wenjuan Wei, Patrice Blondeau, Dustin Poppendieck, Xiaoyu Liu, Christiaan J. E. Delmaar, Peter Fantke, Olivier Jolliet, Hyeong-Moo Shin, Miriam L. Diamond, Manabu Shiraiwa, Andreas Zuend, Philip K. Hopke, Natalie von Goetz, Markku Kulmala, and John C. Little. Assessing Human Exposure to SVOCs in Materials, Products, and Articles: A Modular Mechanistic Framework. *Environ. Sci. Technol.* **2021**, *55* (1), pp 25–43. <https://pubs.acs.org/doi/10.1021/acs.est.0c02329>.

**Third Joint Winner.** Astrid Avellan, Jie Yun, Bruno P. Morais, Emma T. Clement, Sonia M. Rodrigues, and Gregory V. Lowry. Critical Review: Role of Inorganic Nanoparticle Properties on Their Foliar Uptake and *in Planta* Translocation. *Environ. Sci. Technol.* **2021**, *55* (20), pp 13417–13431. <https://pubs.acs.org/doi/10.1021/acs.est.1c00178>.

**First Joint Runner-Up.** Mark A. Borchardt, Alexandria B. Boehm, Marc Salit, Susan K. Spencer, Krista R. Wigginton, and Rachel T. Noble. The Environmental Microbiology Minimum Information (EMMI) Guidelines: qPCR and dPCR Quality and Reporting for Environmental Microbiology. *Environ. Sci. Technol.* **2021**, *55* (15), pp 10210–10223. <https://pubs.acs.org/doi/10.1021/acs.est.1c01767>.

**Second Joint Runner-Up.** Costas A. Velis and Ed Cook. Mismanagement of Plastic Waste through Open Burning with Emphasis on the Global South: A Systematic Review of Risks to Occupational and Public Health. *Environ. Sci. Technol.* **2021**, *55* (11), pp 7186–7207. <https://pubs.acs.org/doi/10.1021/acs.est.0c08536>.

## ■ FEATURE/PERSPECTIVE/VIEWPOINT

**First Joint Winner.** Shifa Zhong, Kai Zhang, Majid Bagheri, Joel G. Burken, April Gu, Baikun Li, Xingmao Ma, Babetta L. Marrone, Zhiyong Jason Ren, Joshua Schrier, Wei Shi, Haoyue Tan, Tianbao Wang, Xu Wang, Bryan M. Wong, Xusheng Xiao, Xiong Yu, Jun-Jie Zhu, and Huichun Zhang. Machine Learning: New Ideas and Tools in Environmental Science and Engineering. *Environ. Sci. Technol.* **2021**, *55* (19), pp 12741–12754. <https://pubs.acs.org/doi/10.1021/acs.est.1c01339>.


**Second Joint Winner.** Carla Ng, Ian T. Cousins, Jamie C. DeWitt, Juliane Glüge, Gretta Goldenman, Dorte Herzke, Rainer Lohmann, Mark Miller, Sharyle Patton, Martin Scheringer, Xenia Trier, and Zhanyun Wang. Addressing Urgent Questions for PFAS in the 21st Century. *Environ. Sci. Technol.* **2021**, *55* (19), pp 12755–12765. <https://pubs.acs.org/doi/10.1021/acs.est.1c03386>.

**Third Joint Winner.** Alex T. Ford, Marlene Ågerstrand, Bryan W. Brooks, Joel Allen, Michael G. Bertram, Tomas Brodin, ZhiChao Dang, Sabine Duquesne, René Sahn, Frauke Hoffmann, Henner Hollert, Stefanie Jacob, Nils Klüver, James M. Lazorchak, Mariana Ledesma, Steven D. Melvin, Silvia Mohr, Stephanie Padilla, Gregory G. Pyle, Stefan Scholz, Minna Saaristo, Els Smit, Jeffery A. Steevens, Sanne van den Berg, Werner Kloas, Bob B. M. Wong, Michael Ziegler, and Gerd Maack. The Role of Behavioral Ecotoxicology in

Environmental Protection. *Environ. Sci. Technol.* **2021**, *55* (9), pp 5620–5628. <https://pubs.acs.org/doi/10.1021/acs.est.0c06493>.

**First Joint Runner-Up.** Douglas B. Collins and Delphine K. Farmer. Unintended Consequences of Air Cleaning Chemistry. *Environ. Sci. Technol.* **2021**, *55* (18), pp 12172–12179. <https://pubs.acs.org/doi/10.1021/acs.est.1c02582>.

**Second Joint Runner-Up.** Rose S. Kantor, Kara L. Nelson, Hannah D. Greenwald, and Lauren C. Kennedy. Challenges in Measuring the Recovery of SARS-CoV-2 from Wastewater. *Environ. Sci. Technol.* **2021**, *55* (6), pp 3514–3519. <https://pubs.acs.org/doi/10.1021/acs.est.0c08210>.

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