| Primo Autore DAIS | Abstract | DOI | SJR percentile |
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| Gabriele Santin | Explaining the Explainers in Graph Neural Networks: a Comparative Study | https://doi.org/10.1145/3696444 | 1 |
| Loris Calgaro | Marine pollution management requires identifying all sources of contaminants, yet shipping's role in marine contamination remains unexplored. To address this gap, we investigated shipping contribution to water and air pollutant loads in the Northern Adriatic Sea in 2018 and under two future scenarios. The approach integrated (i) modelled data of shipping-related emissions, (ii) load from tributaries, and (iii) land-based emissions to the atmosphere. The results showed that shipping significantly contributes to copper, zinc (from antifouling paints), nitrogen (from sewage and food waste), phenanthrene, and naphthalene (from scrubbers and bilge water) loads.<br>Under an increased shipping traffic scenario by 2050, scrubber use reduces atmospheric emissions but increases water pollutants, while alternative fuels reduce air contaminants emission with no significant increase in water pollution. This study sets the foundation to apply water and air quality models to identify areas of concern and assess the environmental impacts of future shipping emission control strategies. | https://doi.org/10.1016/j.marpolbul.2025.117573 | 5 |
| Sebastiano Vascon | we used LLM and environmental data to analyze risk in veneto coastal areas | https://doi.org/10.1016/j.ijdrr.2025.105818 | 5 |
| Loris Calgaro | A novel method to assess the dilution of complex mixtures in the marine environment: Application to marine scrubber water effluents | https://dx.doi.org/10.1016/j.marpolbul.2025.118541 | 5 |
| Elena Badetti | Assessing safety and sustainability performance of advanced nanomaterials: A tiered approach along the innovation process | https://doi.org/10.1016/j.impact.2025.100573 | 5 |

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| Loris Calgaro | An industrial sources-based methodology for the prioritization of site-specific emerging contaminants in water resourcesAn industrial sources-based methodology for the prioritization of site-specific emerging contaminants in water resources | DOI:10.1007/s11356-025-36733-5 | 5 |
| Sebastiano Vascon | Integrating AI and climate change scenarios for multi-risk assessment in the coastal municipalities of the Veneto region. To achieve the goals, we used environmental data from the municipalities and machine learning models. | https://doi.org/10.1016/j.scitotenv.2025.178586 | 6 |
| Sebastiano Vascon | We used a data-driven approach grounded on environmental data and machine learning to evaluate cumulative impact on the marine ecosystem | https://hdl.handle.net/10278/5106097 | 7 |
| Sebastiano Vascon | we used graph neural networks and environmental data to study the distribution of seagrasses in the mediterranean. | https://doi.org/10.1016/j.envsoft.2025.106678 | 7 |
| Loris Calgaro | Investigating contaminants of emerging concern (CECs) in the Venice Lagoon: A suspect screening approach for the analysis of water and sediment contamination | https://doi.org/10.1016/j.emcon.2025.100557 | 7 |

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| Fabio Aricò | In this work, a novel family of bio-based α,ω-diene carbonate monomers was synthesized starting from bis(hydroxymethyl)furan (BHMF). These monomers were then subjected to acyclic diene metathesis (ADMET) polymerization with seven different ruthenium catalysts. The resulting bio-based polymers exhibited thermal degradation temperatures (Td5%) ranging from 156 °C to 244 °C and glass transition temperatures (Tg) from −8 °C to −36 °C. These novel polycarbonates were compared to previously reported polyesters and polyethers derived from similar furan-based α,ω-diene monomers. This unprecedented comparison and co-polymerization reactions highlight the versatility of furan-based monomers, but also underscores the possibility to expand their application in creating tailored bio-based materials for diverse applications. This work is inherent to the following objective relating to the department of excellence: reduction of environmental risks and impacts along the life cycle of products and processes (SDG 12, 14 and 15). | DOI https://doi.org/10.1039/D4GC05132G | 10 |

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| Fabio Aricò | The research on greener solvents is of paramount importance for achieving sustainable processes. To replace traditional hazardous media, green solvents must display negligible environmental effects and biological degradability while being available on a large scale and exhibiting comparable or even superior performances than the currently employed media. In this scenario, organic carbonates (OCs) are among the most prominent candidates as they are commercially available at a reasonable price and offer a broad range of tunable proprieties, making them usable in a wide range of applications. Based on this premise, this review focuses on the use of OCs as green media ranging from laboratory synthetic approaches to industrial applications. Organic carbonates go beyond simply replacing toxic solvents; they offer an opportunity to transform a variety of processes into sustainable processes. From enhancing the performance of batteries and advancing materials science to driving innovations in green chemistry and improving industrial sustainability, their potential is vast. The adoption of organic carbonates as green media is likely to have far-reaching effects, making them valuable tools for researchers and industries aiming to develop more sustainable processes.<br>This review is inherent to the following objective relating to the department of excellence: reduction of environmental risks and impacts along the life cycle of products and processes (SDG 12, 14 and | DOI: 10.1039/d5gc00536a | 10 |
| Elena Badetti | A methodological approach to assess the release of metals from metallic- and electronic-wastes exposed to rainfall events in waste collection centers | https://doi.org/10.1016/j.hazadv.2025.100877 | 11 |

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| Elena Semenzin | L'articolo presenta lo sviluppo e l'applicazione di uno strumento di analisi di rischio ecologico a sedimenti dragati in laguna di Venezia ed è quindi collegato alla tematica del PdE "Gestione e controllo di microinquinanti ed inquinanti emergenti" | 10.1186/s12302-025-01225-3 - 10278/5103710 | 13 |
| Elena Semenzin | L'articolo tratta dell'implementazione del framework Safe and Sustainable by Design, ovvero dello sviluppo e applicazione di metodologie di Analisi di Rischio e di Analisi del ciclo di vita per prodotti innovativi; si collega quindi alla tematica PdE "Riduzione di rischi e degli impatti ambientali lungo il ciclo di vita di prodotti e processi" | 10.1016/j.cesys.2025.100381 - 10278/5107348 | 13 |

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| Fabio Aricò | The ultimate goal of biorefinery is to move away from a fossil-based industry aiming to a more sustainable one centered on the use of renewable feedstocks. It is well known that numerous bio-based platform chemicals can be obtained from biomass. Among them, 5-hydroxymethylfurfural (HMF) and 2,5-bis(hydroxymethyl)furan (FDCA) – achieved by HMF hydrogenation – are two of the most studied representatives. The etherification of these molecules with different alcohols yields 5-(alkoxymethyl)furfurals (AMFs) and 2,5-bis(alkoxymethyl) furans (BAMFs) respectively, both demonstrating potential application as fuel additives. In this work, a comprehensive investigation on the etherification of HMF and 2,-5-bis(hydroxymethyl)furan (BHMF) promoted by a commercially available ion exchange resin – Purolite CT275DR – is conducted using a continuous flow apparatus. The reaction conditions are optimized for the etherification of BHMF with ethanol and then extended to achieve a library of BAMFs. Finally green metrics are calculated for the etherification of BHMF with ethanol and the values are compared to previously published procedures. The work s inherent to the following objective relating to the department of excellence: reduction of environmental risks and impacts along the life cycle of products and processes (SDG 12, 14 and 15). | DOI: 10.1002/adsu.202500526 | 14 |
| Marco Picone | The UV filters Ethyl-hexyl salicylate and Octocrylene affects feeding and reproduction in the marine copepod Acartia tonsa | https://doi.org/10.1016/j.marenvres.2025.107375 | 14 |

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| Fabio Aricò | This work focuses on alternative, green synthetic methods for producing a bio-based bis-epoxy compound – namely bis(oxiran-2-ylmethyl) furan-2,5-dicarboxylate (DGF) – in consideration of its potential use as monomer for epoxy resins. The synthesis of DGF was conducted via transesterification reaction of 2,5-furandicarboxylic acid dimethyl ester (FDME) with glycidol. A variety of homogeneous, heterogeneous, and enzymatic catalysts were investigated, and the syntheses were carried out avoiding any chlorine-based chemicals and employing green media.<br>The homogeneous route yielded the best results when the reaction was conducted in 2-Me-THF as medium and using triethylamine as a catalyst. DGF was isolated as pure in 82 % yield through a simple liquid-liquid extraction. The chemo-enzymatic route employed Candida antarctica lipase B (CAL-B) supported on various Supported Ionic Liquid-Like Phases (SILLPs). In this case DGF yield was only 10–20 %. Interestingly, the reaction led to similar results even in the absence of the enzyme, suggesting that the ionic liquid-like phase on the resin was not a passive support, but it actively participated in promoting the transesterification reaction. Thus, the efficiency of several SILLPs as catalysts was evaluated. Among them, the butyl imidazolium chloride SILLP demonstrated superior catalytic performance compared to supported alkyl ammonium salts leading to 70 % | https://doi.org/10.1016/j.scp.2025.102101 | 16 |

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| Andrea Brunelli | Nell'ambito dello sviluppo di un imballaggio alimentare innovativo, l'articolo riguarda la valutazione della sua sicurezza durante la fase di design, seguendo le linee guida ("Safe and Sustainable by design framework") proposte dal Joint Research Center. La tematica dell'articolo risulta quindi affine all'obiettivo del PdE "RIDUZIONE DI RISCHI E IMPATTI AMBIENTALI LUNGO IL CICLO DI VITA DI PRODOTTI E PROCESSI" | DOI: 10.1039/d5en00435g | 17 |
| Andrea Brunelli | Safe and sustainable by design-compliant LDPE food packaging embedding multicomponent nanomaterials for food protection | DOI: 10.1039/d5en00435g | 17 |

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| Loris Calgaro | The use of active pharmaceutical ingredients (APIs) has enhanced life quality and longevity but poses significant environmental risks to ecosystems and human health. Evidence-based risk assessments are essential for addressing these issues, requiring detailed data on API presence, behavior, and effects in the environment. In particular, predictive exposure models offer a cost-effective tool to support such investigations. This study focuses on the application of a multimedia level III fugacity model to estimate the predicted environmental concentrations (PECs) and to simulate transport, distribution, and persistence of nine APIs in the Venice Lagoon (Italy), a transitional environment subjected to multiple anthropocentric stressors. Concentrations of the studied APIs in water were estimated within one order of magnitude of measured data, while the model underestimated the concentration of azithromycin and 17-β-estradiol in the sediments due to water half-life overestimation and lack of information about unmonitored emission sources. In detail, the highest levels of APIs in the water were estimated for amoxicillin and clarithromycin, while sediments showed a significant presence of azithromycin and ciprofloxacin. Model results also showed the possibility for sediments to act as sink for azithromycin, ciprofloxacin, erythromycin, estrone, and 17-β-estradiol. For all target APIs, degradation in the water column and advective outflow were the | https://doi.org/10.1007/s11356-025-36217-6 | 21 |
| Francesco Valentino | Produzione di biomassa microbica (single cell proteins, SCP) da sottoprodotti agro-alimentari attraverso sistemi basati sulla crescita di colture microbiche miste | https://doi.org/10.1016/j.nbt.2025.06.003 | 22 |

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| Andrea Brunelli | L'articolo riguarda lo studio del rilascio di metalli da rifiuti elettronici stoccati in ecocentri al fine di migliorarne le strategie di gestione e conseguentemente diminuirne l'esposizione in ambiente. L'argomento rientra quindi all'interno della tematica PdE "Riduzione di rischi e impatti ambientali lungo il ciclo di vita di prodotti e processi". | https://doi.org/10.1016/j.hazadv.2025.100877 | 23 |
| Fabio Aricò | This work focuses on the preparation of dimethyl isosorbide a well known green media. The methylation of isosorbide to produce dimethyl isosorbide was carried out using dimethyl carbonate as methylating agent and reaction medium and a MgAl mixed oxide derived from the calcination of a commercial hydrotalcite as basic catalyst. This reaction was carried out using three types of reactors: a continuous liquid flow reactor and two batch reactors, the first one working at autogenous pressure and the other one at atmospheric pressure. The best results were achieved for the atmospheric pressure reactor, with the dimethyl isosorbide yield being 100 % at 110 ºC, after 8 h. Catalyst recycling was also demonstrated. This work focuses on the topic of the department of excellence:reduction of environmental risks and impacts along the life cycle of products and processes (SDG 12, 14 and 15). | https://doi.org/10.1016/j.apcata.2024.120088 | 26 |

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| Alessandra Raffaetà | L'articolo propone un modello per la caratterizzazione spazio-temporale dell'inquinamento dovuto al rumore sottomarino generato dalle imbarcazioni di pesca nel Mar Adriatico Settentrionale. Questo modello si può inserire nella sfida del progetto di Eccellenza riguardante la gestione e controllo di microinquinanti e inquinanti emergenti. Infatti il rumore sottomarino è considerato una minaccia seria per gli ecosistemi marini da numerosi enti internazionali. Di conseguenza avere la possibilità di creare delle mappe del rumore sottomarino è di fondamentale importanza per monitorare la qualità della vita acquatica, valutare le possibilità di rischi e informare i responsabili delle politiche ambientali, affinché si possano sviluppare efficaci piani per garantire un ecosistema sano. | https://hdl.handle.net/10278/5102187 | 39 |

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| Fabio Aricò | Thermoplastic polyesters (PEs), with their versatile properties, are indispensable in everyday life. However, increasing concerns about the environmental impact of fossil-based polymers have driven research into renewable alternatives. Among bio-based polymers, furan-derived PEs such as poly(ethylene furanoate) (PEF) have garnered significant attention. The synthesis of PEF, as well as other similar 2,5-furandicarboxylic acid (FDCA)-based polymers, is mainly based on bulk polycondensation (PC) that in general requires elevated temperatures and low pressure, making the process energy-intensive and vulnerable to thermooxidative degradation. In this view, entropically driven ring opening polymerization (ED-ROP) might represent an interesting potential alternative since it requires milder conditions and is intrinsically more atom economic. From these premises, this work focuses on developing an alternative synthetic strategy to biobased PEs through ED-ROP of macrocycles derived from FDCA dimethyl ester (FDME). These macrocycles were prepared by reacting FDME with diols via pseudo-high dilution condensation (PHDC) using tibutyltin(IV) oxide as a catalyst and cyclopentyl methyl ether as a recyclable green solvent. Isolation of the pure macrocycles is achieved by simple crystallization from the reaction mixture. Subsequent ROP of pure macrocycles is | doi.org/10.1002/ejoc.202500737 | 42 |

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| Marta Simeoni | L'articolo esplora alcune ottimizzazioni computazionali per il calcolo del rumore sottomarino generato dai pescherecci nel mare Adriatico settentrionale. Il modello per la caratterizzazione spazio-temporale dell'inquinamento dovuto al rumore sottomarino e' stato proposto in un articolo precedente e le ottimizzazioni considerate in questo lavoro sono fondamentali per l'effettiva applicabilità dell'approccio proposto.<br>La tematica di ricerca si può inserire nella sfida del progetto di Eccellenza riguardante la gestione e controllo di microinquinanti e inquinanti emergenti. Infatti il rumore sottomarino è considerato una minaccia seria per gli ecosistemi marini da numerosi enti internazionali. Di conseguenza, avere la possibilità di creare delle mappe del rumore sottomarino importante per monitorare la qualità della vita acquatica, valutare le possibilità di rischi e informare i responsabili delle politiche ambientali, affinché si possano sviluppare efficaci piani per garantire un ecosistema sano. | https://hdl.handle.net/10278/5102188 | - |
| Marta Simeoni | The paper present PMAR (Pressure models for MARine activities), a modelling framework and open-source Python-based software designed to assess anthropogenic pressures for marine management. PMAR uses Lagrangian trajectories calculated from ocean models to simulate pressure dispersion. In the paper, PMAR is applied to investigate the distribution of surface macroplastics in the Black Sea. | https://doi.org/10.1016/j.envsoft.2025.106822 | |
| Cristina Cavinato | Evaluation of calcium alginate beads immobilization of Chlorella vulgaris for biomass production in space life support systems | https://doi.org/10.1016/j.biortech.2025.133522 | |