



17th Brazilian Congress of Polymers - 17th CBPol Joinville – SC, October 29 to November 2, 2023

The Brazilian Polymers Conference (CBPol) is the main scientific forum in polymer science and technology in Brazil, being held every two years since 1991. Its 17th edition was organized by a group of professors from the State University of Santa Catarina (UDESC), the University of the Region of Joinville (Univille), the Federal University of Santa Catarina (UFSC), the Federal University of Rio Grande do Sul (UFRGS) and the Federal Technological University of Paraná (UTFPR), in partnership with the Brazilian Polymer Association (ABPol). The conference was held at the Expoville Convention and Exhibition Center, in Joinville, from October 29 to November 02, 2023. Joinville, known as the ‘City of Flowers’ and the ‘Brazilian Capital of Dance’, is a pleasant industrial and tourist city located in the northeast of the State of Santa Catarina in southern Brazil.

The 17th CBPol was sponsored by the Brazilian Funding Agencies CAPES, FAPESC and FAPESP (for participants from the State of São Paulo) and the companies Krona Tubos e Conexões, Regional Council of Engineering and Agronomy of Santa Catarina – CREA-SC, Instron, TA Instruments, DP Union, Zwick/Roell, DBM Nano, PerkinElmer, Netzsch, Reo Term, Shimadzu, Anton Paar, AX Plásticos Maquinas Técnicas Ltda, DOW, HSensor, KCEN, Royal Society of

Chemistry, CCDM, IOTO International and Wortex Group, in addition to having the support of the Brazilian Association of Rubber Technology (ABTB), INCT Polysaccharides, Plástico Virtual, Joinville Convention & Visitors Bureau and Rhein Beer.

The opening session of the 17th CBPol took place on the evening of October 29, 2023 (Sunday). Those responsible for the session were Prof. Marco Aurélio de Paoli (President of ABPol), Prof. Sérgio Henrique Pezzin (Chair of the Conference), Profa. Palova Santos Balzer (Vice-chair), Profa. Daniela Becker (Coordinator of the Scientific Committee), Mr. Willian Escher (Secretary of Economic Development of Joinville), Profa. Yoná da Silva Dalonso (Dean of Extension and Community Affairs at Univille), Prof. Antônio Heronaldo de Souza (Director of the Center for Technological Sciences at UDESC Joinville), Mr. Giuliano Rodrigo de Mello (President of the Joinville Convention & Visitors Bureau), Eng. Daniel Kandler Signori (Regional Director of CREA-SC in Joinville) and Eng. Israel Almeida Furtado (Research and Development Manager at Krona Tubos e Conexões), representing all the sponsors of the conference (Figure 1).



Figure 1. Images of the opening session of the 17th CBPol. First image (from left to right): Giuliano Rodrigo de Mello (President of the Joinville Convention & Visitors Bureau), Yoná da Silva Dalonso (Univille representative), Daniela Becker (Coordinator of the Scientific Committee), Marco Aurélio de Paoli (President of ABPol), Sérgio Henrique Pezzin (Conference Chair), Willian Escher (Secretary of Economic Development of Joinville), Antônio Heronaldo de Souza (representative of UDESC) and Daniel Kandler Signori (CREA-SC).



Figure 2. Images of the ABPol awards. From top to bottom, from left to right: Prof. Marco Aurélio de Paoli (president of ABPol), Prof. Luiz Henrique Capparelli Mattoso (winner of the ABPol “Profa Eloisa Mano” award) and Profa. Bluma Günther Soares (representative of ABPol); Profa. Mariana Agostini de Moraes (winner of the “Young Researcher” award from ABPol) and Prof. André Fajardo (representative of ABPol); and Marcelo Farah (winner of the ABPol “Polymer Technology” award) and Frederico Mendes Junior (representative of ABPol).

The president of ABPol, Prof. Marco Aurélio de Paoli, emphasized the importance of ABPol and CBPol for the continuous advancement of polymer science and technology in Brazil, especially in this post-pandemic moment. In his speech, the general coordinator of the conference, Sérgio Henrique Pezzin, addressed the points of circularity and innovation, currently crucial for research in polymer science and technology, and highlighted the strength of women who are part of the polymer community in Brazil. The scientific coordinator of the event, Profa. Daniela Becker highlighted the number of papers approved for presentation at the event and their distribution in the various regions of the country and abroad.

After the presentations, outstanding Brazilian researchers were awarded: Prof. Luiz Henrique Capparelli Mattoso (EMBRAPA Instrumentation) received the ABPol “Profa Eloisa Mano” award for Polymer Science, Profa. Mariana Agostini de Moraes (UNIFESP) received the “ABPol Young Researcher” award and the ABPol “Polymer Technology” award was given to Dr. Marcelo Farah (Braskem) (Figure 2). Subsequently, the President of ABPol swore in the new board members of the association and presented the new board of directors of ABPol for the 2023/2025 biennium. The ceremony ended with dance performances performed by student dancers from the Municipal Ballet School (Joinville), followed by a welcome cocktail for all participants (Figure 3).

On Sunday afternoon, ABPol’s administrative assistants, Mr. Marcelo Perez Gomes and Ms. Layane Souza, began the delivery of the conference documents to the participants. At the same time, there was the 1st. Meeting of the National Institute of Science and Technology in Polysaccharides (INCT Polissacarídeos), under the coordination of Prof. Edvani Curti Muniz (UFPI) (Figure 4).

On the following four days (Monday to Thursday), the activities of each period of the day (morning and afternoon) began with a plenary lecture followed by keynotes and oral presentations in 5 or more parallel sessions, except for Tuesday afternoon. The presentations were classified into 11 thematic symposia according to their themes: 1) ‘Polymerization reactions and polymer chemistry’; 2) ‘Polymer physics and characterization’; 3) ‘Polymer nanostructures and nanocomposites’; 4) ‘Blends, composites and polymer networks’; 5) ‘Processing and materials design’;



Figure 3. Images of a dance performance by the Municipal Ballet School of Joinville (left) and welcome cocktail (right).

6) ‘Rubber and Elastomers’; 7) ‘Recycling and environmental issues associated with polymers’; 8) ‘Biomedical applications of polymers’; 9) ‘Polymer in agriculture and industrial special applications’; 10) ‘Innovation and management involving polymers and education’; and 11) ‘Technical Sessions’. More details of the schedule can be found on the event’s website at <https://cbpol.com.br/>. For the first time in its history, CBPol had an application developed exclusively for the event (EventMobile/Aptor Software), with continuous day-to-day support.

Tuesday afternoon (10/31) was dedicated to two parallel activities highlighted in the event: Circularity and Innovation (Figure 5). In the panel on Circularity, under the mediation of Prof. Walter Ruggeri Waldman (UFSCar), there was the participation of Prof. Caio Gomide Otoni (UFSCar), Ms. Fabiana Quiroga Garbin (Braskem) and diplomat Francisco Nelson de Almeida Linhares Júnior (Ministry of Foreign Affairs – Brazil), which was followed by a round table with broad participation on the subject. In the Innovation panel, there was the presentation of a motivational lecture by Prof. Diego Piazza (UCS), “Seeing your Research as a Business”, followed by the I Workshop on Innovation and Entrepreneurship in Polymers, coordinated by Prof. Fabiano Ferreira (UFMG). In the workshop, teams were created that worked on proposals for possible businesses in polymers, with the mediation of experienced collaborators in the generation of startups. At the end of the day, there was the presentation of ‘pitches’ from the teams, with the evaluation of professionals in the area and the award of the best proposals.

From Monday to Wednesday, at the end of each day (late afternoon), poster sessions were held (Figure 6). A coffee-break was offered at each time of the day. During the coffee break on Monday afternoon, there was the launch of the book “Plastic Recycling”, with the presence of the authors Hélio Wiebeck (USP) and Derval dos Santos Rosa (UFABC). At the same time, there were stands for the exhibition of products and equipment associated with polymer research and related branches of science hosted by the manufacturing companies: Krona Tubos e Conexões, CREA-SC, Instron, TA Instruments, DP Union, Zwick/Roell, DBM Nano, PerkinElmer, Netzsch, Reo Term, Shimadzu, Anton Paar, AX Plásticos, DOW, HSensor, KCEN, Royal Society of Chemistry, CCDM, IOTO International and Wortex Group (Figure 6). In addition, a ‘happy hour’ (on Monday evening) and a banquet/get-together dinner (on Wednesday evening) were offered to attendees. These social activities provided an extra opportunity for networking among the participants.

The 17th CBPol had 880 registered attendees (including regular participants, sponsor representatives, speakers and visitors/companions), from the following countries: South America – Brazil (865), Chile (2), Peru (2), Uruguay (1) and Colombia (1); North America – USA (2); Europe – Poland (1), Ireland (1), Netherlands (1), France (1), Great Britain (1), Portugal (1) and Asia – Singapore (1) (Figure 6). Of the total, approximately 60% were students and 40% were professors or researchers, with 53.5% women, 46.3% men, and 0.2% non-binary. Of the students present at the event, 131 were undergraduate or technical education, while 345 were graduate students



Figure 4. Above: Image of the conference reception. Below: Participants of the INCT Polissacarídeos meeting.



Figure 5. Panel on Circularity (above); Lecture by Prof. Diego Piazza (UCS) at the Innovation Panel (at the middle); Winning team of the proposals worked on in the Innovation and Entrepreneurship Workshop (below).

(master's or doctorate). The number of registered participants in Brazil by state (federative regions) is shown in Figure 7, with congressmen from nineteen states of the federation participating in the event. The most significant number of researchers was from the state of São Paulo, followed by Santa Catarina, Rio Grande do Sul, Rio de Janeiro and Paraná. However, all Brazilian regions (N, NE, CO, SE and S) were present at the event.

Out of a total of 887 submissions, 857 papers, with 2,164 authors, were accepted for presentation at the conference. All articles have been previously submitted to peer review. The review of the articles was coordinated by Profa. Daniela Becker (UDESC) with the collaboration of 11 symposium coordinators and 183 *ad hoc* reviewers. The papers presented, including plenary and technical sessions, were divided as follows: 6 plenary lectures (60 min each), 28 keynotes (30 min each), 160 oral presentations (20 min each), 16 technical presentations (20 min each) and 669 posters.

The symposium on blends, composites and polymer networks received the most significant number of papers (196), followed by the symposia on polymeric nanocomposites and

nanostructures (165) and on recycling and environmental issues related to polymers (140), Figure 8, reflecting the global scenario of polymer research. Considering the UN Sustainable Development Goals, the papers presented in the different sessions were aligned with one or more of the following goals: 2, Zero hunger and sustainable agriculture; 6, Drinking water and sanitation; 7, Clean and affordable energy; 9, Industry, innovation and infrastructure; 12, Responsible consumption and production; and 15, Terrestrial Life.

The plenary lectures were given by renowned Brazilian and foreign researchers (Table 1 and Figure 9), which covered emerging areas of polymer research around the world.

On Tuesday evening, immediately after the poster session, there was a meeting of the editorial board of the Journal "Polymers Science and Technology", with the participation of congressmen members of the board, such as Prof. Sebastião V. Canevarolo (Editor-in-chief), and the participation *online* of Prof. Antonio Aprigio S. Curvelo (President of the Editorial Board).

The poster awards were presented at the closing ceremony in the late morning of October 31 (Thursday). The poster evaluation committee was coordinated by Profa. Juliana Kloss (UTFPR), with the three best student works in each category (doctorate, master's and undergraduate) awarded. The award-winning students are listed below by category.



Figure 6. Images of i. a coffee-break; ii. the launch of the book "Reciclagem de Plásticos"; iii. sponsors' stands, and iv. a poster session.

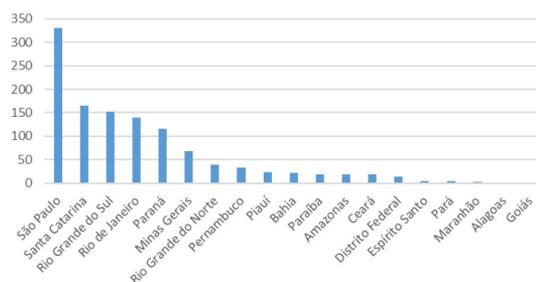


Figure 7. Number of registered participants per federative unit in Brazil.

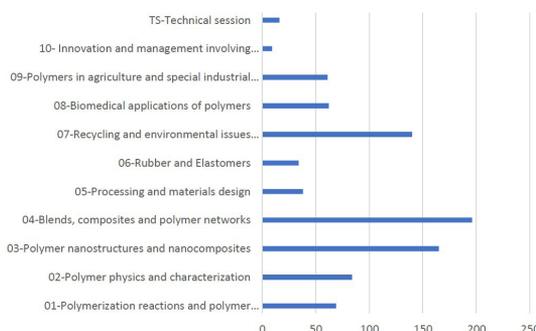


Figure 8. Number of papers in each symposium presented at the 17th CBPol.

Table 1. Plenary lectures of the 17th CBPol

Title	Lecturer
Gels for Environmental Remediation: From Aerogels to Nanosponges	Artur José Monteiro Valente – University of Coimbra (Portugal)
Polymers and Agriculture: Present and Promising Technological Future Developing Strategies for Polymer Redesign and Recycling Using Reaction Pathway Analysis	Luiz Henrique Capparelli Mattoso – EMBRAPA Instrumentação (Brazil) Linda J. Broadbelt - Northwestern University (USA)
Braskem's Innovation Journey to Implement the Circular Economy	Fabiana Quiroga Garbin – Braskem (Brazil)
Two Decades of Polymer Nanocomposites Research: From Academia to Industry	Ricardo Vinicius Bof de Oliveira - 2D Materials (Singapore)
Natural Fiber and Hybrid Composites: Science and Technology	Sandro Campos Amico – Federal University of Rio Grande do Sul (Brazil)

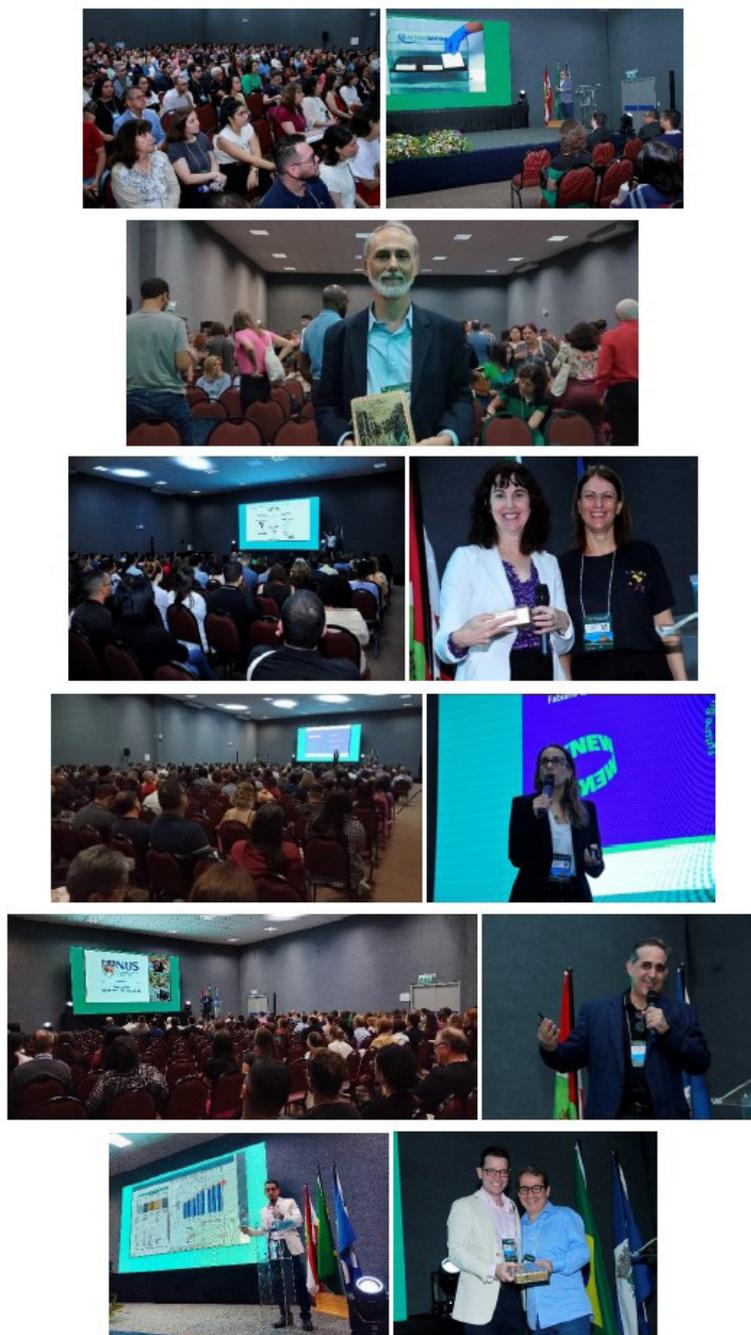


Figure 9. Images of the plenary speakers of the 17th CBPol. From top to bottom, from left to right: Prof. Artur Valente, Prof. Luiz Henrique Capparelli Mattoso, Profa. Linda Broadbelt, Fabiana Quiroga Garbin, Dr. Ricardo V. Bof de Oliveira, Prof. Sandro Campos Amico.

Best Poster Awards - Undergraduate Students

1st place: Pamela Xavier Mendoza (Universidade Federal de Santa Catarina - UFSC) for the study entitled “Functionalization of Clay Nanoparticles by Plasma for Application in Active Packaging”. Co-authors: Larissa N. Carli (UFSC), Pâmela R. Oliveira (UFSC), Renata C. da Costa (UFSC), Cesar Aguzzoli (UCS) and Janaina da Silva Crespo (UCS).

2nd place: Evelin Thainá Barbosa Serpa (Faculdade de Tecnologia de Sorocaba – FATEC SO) for the study entitled “Performance Assessment of Bacterial Cellulose Films from Kombucha in Conservation of Strawberries in Natura”. Co-authors: Maira L. Rezende, Renata Leme, Suelen C. de Almeida Sacardo, Henrique S. Medeiros Lopes and Paulo J. Bálamo (FATEC SO).

3rd place: Vitor Bühler Salomão (Universidade Federal de São Carlos - UFSCar) for the study entitled “Effect of Cellulose Nanocrystals on Water Absorption of Sulfonated SBS Based Ionic Polymer Metal Composite”. Co-authors: Paulo O. Gall, Guilherme E. de O. Blanco, Matheus C. Saccardo and Carlos H. Scuracchio (UFSCar).

Best Poster Awards - Master Students

1st place: Samara da Silva Araújo (Universidade Estadual Paulista/Campus de Rosana – UNESP) for the study entitled “Examining the Dispersion of Acai Residue as a Filler in Natural Rubber Matrix Using Rheometry, SEM-EDX, and Tensile Strength in the Production of Eco-Friendly Biocomposite”. Co-authors: Gleyson A. Santos, Gabrieli R. Tolosa, Eduardo R. Budemberg, Aldo E. Job, Carlos T. Hiranobe, Flávio C. Cabrera, Leonardo Lataro, Renivaldo José dos Santos (UNESP).

2nd place: João Gabriel Ribeiro (Universidade Federal do ABC - UFABC) for the study entitled “Surface-Modified Microfibrillated Cellulose from Eucalyptus Sawdust for Potentially Toxic Elements Removal from Contaminated Water”. Co-authors: Rennan F. da Silva Barbosa, Derval S. Rosa (UFABC).

3rd place: Heliton Barra (Universidade Tecnológica Federal do Paraná - UTFPR) for the study entitled “Study of EVA/Bentonite Clay-Niobium Pentoxide Hybrid Systems by DRX and TD-NMR”. Co-authors: Reinaldo Y. Morita, Roberta R. Domingues, Juliana R. Kloss (UTFPR).



Figure 10. Images of the poster award ceremony.

Best Poster Awards - PhD Students

1st place: Cleonice Aparecida Salgado (Universidade Federal de Viçosa – UFV) for the study entitled “Polyurethanes Biodegradation by *Staphylococcus warneri* Isolated from the Gut of Larvae of *Galleria mellonella*”. Co-authors: Pedro M. Pereira Vidigal, Maria C. D. Vanetti (UFV).

2nd place: Laura Pires da Mata Costa (Universidade Federal do Rio de Janeiro - UFRJ) for the study entitled “Plastic Pyrolysis Vaporization”. Co-authors: Julián A. García Cárdenas (UFRJ), Amanda L. Teixeira Brandão (PUC-Rio de Janeiro), José C. C. da Silva Pinto (UFRJ).

3rd place: Andressa de Espíndola Sobczyk (Universidade Federal do Rio Grande do Sul – UFRGS) for the study entitled “Influence of the Washing Process on the Properties of Chitosan-Alginate Composite Films”. Co-authors: Débora J. L. Faccin, Nilo S. M. Cardozo, Isabel C. Tessaro (UFRGS).



Figure 11. Images of the closing session of the 17th CBPol: Audience; Closing speech, from left to right: Profa. Daniela Becker (Scientific Coordinator), Profa. Juliana Kloss (Poster Evaluation Coordinator) and Prof. Marco Aurélio De Paoli (president of ABPol).

At the closing ceremony (Figure 13) at noon on October 31 (Thursday), the president of ABPol, Prof. Marco Aurélio De Paoli, presented an overview of the conference and announced the new board of directors of ABPol for the 2024-2025 biennium, which will be managed by the president-elect Prof. Leonardo Bresciani Canto. The Coordinator of the Congress, Prof. Dr. Sérgio Henrique Pezzin, made a presentation on the scientific highlights of the conference.

Some aspects of the 17th CBPol are particularly noteworthy. Firstly, considering that it was the first post-pandemic ‘in person’ edition of the conference, there was a significant number of registered participants



Figure 12. Image of members of the 17th CBPol Organizing Committee, from left to right: Prof. Sérgio H. Pezzin (UDESC), Profa. Daniela Becker (UDESC), Profa. Noeli Sellin (Univille), Profa. Palova S. Balzer (Univille), Profa. Claudia Sayer (UFSC), Profa. Rosmary Brandalise (UCS), Prof. Sandro C. Amico (UFRGS), Profa. Juliana Kloss (UTFPR) and Profa. Carla Dalmolin (UDESC).

and papers presented, based on the historical average of the event. Secondly, we highlight the differentiated activities related to the Panels on Circularity, including the presence of a diplomat to discuss the global plastics treaty currently under discussion, and Innovation, with the I Innovation and Entrepreneurship Workshop, which allowed several academics the opportunity to experience the process of creating ‘startups’ based on the ideas generated in universities and research centers. It should also be noted the excellent scientific and technological quality of the papers presented at the event, as attested by international representatives. Finally, the scientific and social activities were a great success, providing a favorable environment for discussion and networking among the participants.

We would like to thank the organizing committee (Figure 12) and the scientific committee, as well as the coordinators of the symposia, the poster evaluation committee (Figure 13) and the *ad hoc* reviewers, who played a fundamental role in achieving the excellent scientific quality of the conference. We would also like to thank the funding agencies that supported the event, FAPESP, CAPES and CNPq, as well as the sponsors and exhibitors. We would also like to thank ABPol, its board of directors and collaborators (Mr. Marcelo P. Gomes and Mrs. Layane Souza) for all their support in organizing the event.

Finally, we would like to thank all the participants of the 17th CBPol who contributed significantly to the success of the conference.

We look forward to seeing you at the 18th CBPol!

Sérgio Henrique Pezzin – UDESC (Chair)

Palova Santos Balzer – Univille (Vice-chair)

Daniela Becker – UDESC (Scientific Coordinator)



Figure 13. Images of the Poster Evaluation Committee, coordinated by Profa. Juliana Kloss (UTFPR).