

PÔSTER - RESUMO - DIVULGAÇÃO

GIRLS AND WOMEN IN NANOSCIENCE AND NANOTECHNOLOGY: WEAVING INNOVATIONS FOR THE FUTURE — SCIENTIFIC OUTREACH ACTIONS AT UFNT

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The persistent underrepresentation of women in Physics, Engineering, and Nanotechnology — fields foundational to the development of organic electronics and advanced materials — constitutes a structural barrier with direct consequences for scientific innovation and social equity [1,2]. In Brazil, women occupy fewer than 25% of permanent faculty positions in graduate Physics programs and only 18% of CNPq Research Productivity fellowships in Engineering [3,4], a scenario further compounded by intersectional vulnerabilities affecting Black, quilombola, indigenous, and low-income girls. Addressing this gap demands targeted, territorially anchored, and socially committed interventions. This work reports the partial results of the university extension project "Girls and Women in Nanoscience and Nanotechnology: Weaving Innovations for the Future," developed at UFNT/LABMADE under the scope of the CNPq National Network of Women in Nanoscience (Rede Nacional Mulheres na Nanociência). The initiative employs participatory and action-research methodologies, organized around three structural axes: (1) scientific popularization of Nanoscience and Nanotechnology (N&N); (2) technical training in computational modeling and 3D printing; and (3) intergenerational

mentorship networks. During the evaluated period (September–December 2025), the project engaged 285 members of Basic Education schools, including students from quilombola communities, indigenous peoples, and peripheral urban areas of Araguaína (TO) — populations historically excluded from scientific spaces. The team comprised 5 faculty members, 11 undergraduate students from Physics and Biomedical Engineering programs, and 1 technical-administrative staff member. Notably, 3 Junior Scientific Initiation (PIBIC Jr.) students from partner schools participated directly as collaborators, with fellowships funded by the CNPq National Network of Women in Nanoscience, reinforcing the project's commitment to early-stage scientific formation among underrepresented youth. Thirteen experimental and theoretical activities were conducted through interactive nanocircuits (guided laboratory visits), covering topics such as magnetic nanoparticle synthesis (magnetite), the Tyndall Effect, nano-color phenomena, the Lotus Effect, Fullerene mathematics, quantum mechanics in natural materials, Arduino-based experiments, and computational simulation of nanoscale systems. Additionally, 3D printing demonstrations using recycled PET-bottle filaments integrated sustainability and nanotechnology education, and educational games centered on Women in Science promoted positive gender representation [5,6]. The results demonstrate significant outcomes in scientific literacy, academic self-esteem, and sense of belonging among participating girls. Undergraduate students developed critical extensionist competencies in scientific communication and pedagogical mediation, reinforcing the university–school–community integration. Two works were published in national academic events, and presentations were delivered at the I National Symposium of Women in Nanoscience (UFJF, 2025).

These findings position participatory science outreach — grounded in gender equity and social justice principles — as an effective strategy for broadening STEM participation among historically marginalized groups, with direct relevance to the formation of the next generation of researchers in organic electronics and nanotechnology.

Acknowledgements: INEO Project (FAPESP – grant nº 2025/27044-5 and CNPq – grant nº 408449/2024-1); CNPq National Network of Women in Nanoscience; PROEX/UFNT (PIBEX-NORTE grant).

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Palavras-chave: gender equity in stem; nanoscience outreach; quilombola communities; scientific literacy; women in nanotechnology.