Abstract Submitted
for the 4CS21 Meeting of
The American Physical Society

Soft and stretchable microelectronic fibers for modulation of gut neural circuits.[1] JORGE MARQUEZ CHAVEZ, Department of Physics, New Mexico State University, ATHARVA SAHASRABUDHE, Department of Chemistry, Massachusetts Institute of Technology, POLINA ANIKEEVA, Department of Materials Science and Engineering, Massachusetts Institute of Technology — Implantable neural interfaces are an important technology used to investigate the mechanisms that underlie the functioning of the central nervous system. However, these devices are known to instigate health issues characterized by neuronal death and glial scarring—problems that limit their quality and durability. Inspired by these challenges, as well as by the possibility to extend their application to the peripheral nervous system, the innovation of neural tools that aim at exploring the connection between the brain and the gastrointestinal tract has gained attention in recent years. In this contribution, a soft and fully stretchable multifunctional fiber consisting of a SEBS-based structure and PMMA cladding with gallium as the conductive medium was developed using the Thermal Drawing Process. Laser pattering was used to access the gallium and mount LEDs along the fiber's length. Mechanical tests revealed the preservation of conductivity when placed under deformation, and the I-V and light-output tests demonstrated the functionality of the microelectronics. The fibers represent a prototype of neural probes that could be used to gain a broader understanding of the peripheral nervous system, including that of gut-brain bidirectional communication.

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Date submitted: 17 Sep 2021 Electronic form version 1.4