

UT Austin Exchange Report – Henrique Teixeira

General Experience at UT Austin

My exchange period at the University of Texas at Austin (UT Austin) was an enriching experience. Under the guidance of Professor Deji Akinwande at the Microelectronics Research Center, I had the opportunity to engage in cutting-edge research and collaborate with a diverse group of researchers. The environment at UT Austin was both intellectually stimulating and supportive, providing me with the ideal setting to advance my research and broaden my academic horizons.

Advancements in Research

During my one-month stay, the primary focus was on fabricating two types of samples: Vertical and Lateral stacks. For the Vertical stacks, the goal was to produce heterostructures of $\text{MoS}_2/\text{MXene}$ and $\text{h-BN}/\text{MXene}$, due to their reported good stoichiometry and work function compatibility. For the Lateral stacks, we continued a previous study from Porto involving $\text{MXene}/\text{MoS}_2$ and added the $\text{h-BN}/\text{MXene}$ stack.

One of the most significant aspects of this research was the exploration of two-terminal memory devices using MXene/TMDs , an area with no current reports in the literature. This provided a unique opportunity to assess their performance. It was confirmed that these devices produce promising results in both vertical and planar configurations.

Professional and Personal Impact

This exchange program was a unique opportunity during my PhD to develop research ideas that I had not been able to implement in Porto due to a lack of equipment and facilities. It was also a great chance to learn from more experienced researchers and share my knowledge with them, providing valuable networking opportunities.

On a personal level, this was my first opportunity to visit the United States and experience a different culture. Everyone at UT Austin and in the community was very kind. It was also a lot of fun to meet and socialize with the researchers there, especially during the happy hour provided by Professor Deji, which was an excellent opportunity to connect with his research group.

Fun Facts

- **Wildlife Encounters:** I was amazed to see raccoons in real life and almost had the chance to pet them near the house where I was staying. I also encountered other wildlife animals like vultures and possums, which I had never seen before.
- **SXSW Festival:** The week during the SXSW festival was an incredible experience. The events, walks by the river, and the park were all highlights of my stay.

