Abstract: In this presentation, I will delve into the exciting realm of monolithic 3D integration, where emerging 2D FETs take center stage, empowering advanced memory, and logic devices. Notably, our recent breakthroughs have culminated in the successful demonstration of wafer-scale 2-tier and 3-tier 3D integration, utilizing MoS$_2$ and WSe$_2$ FETs as the building blocks. These achievements have paved the way for multifunctional circuits that hold immense promise for the future of electronics. Furthermore, I will also discuss our work on bio-inspired neuromorphic computing. We have harnessed the potential of 2D materials to design solid-state devices with low power consumption mimicking auditory processing in barn owls, collision avoidance in locusts, probabilistic computing in dragonflies, and multisensory integration in octopus. By combining the power of 2D materials with bio-inspired principles, our work lays a solid foundation for the creation of highly compact and functionally diverse integrated circuits in the revolutionary third dimension. The implications of this technology are far-reaching and hold the potential to shape the future of electronics and computing.