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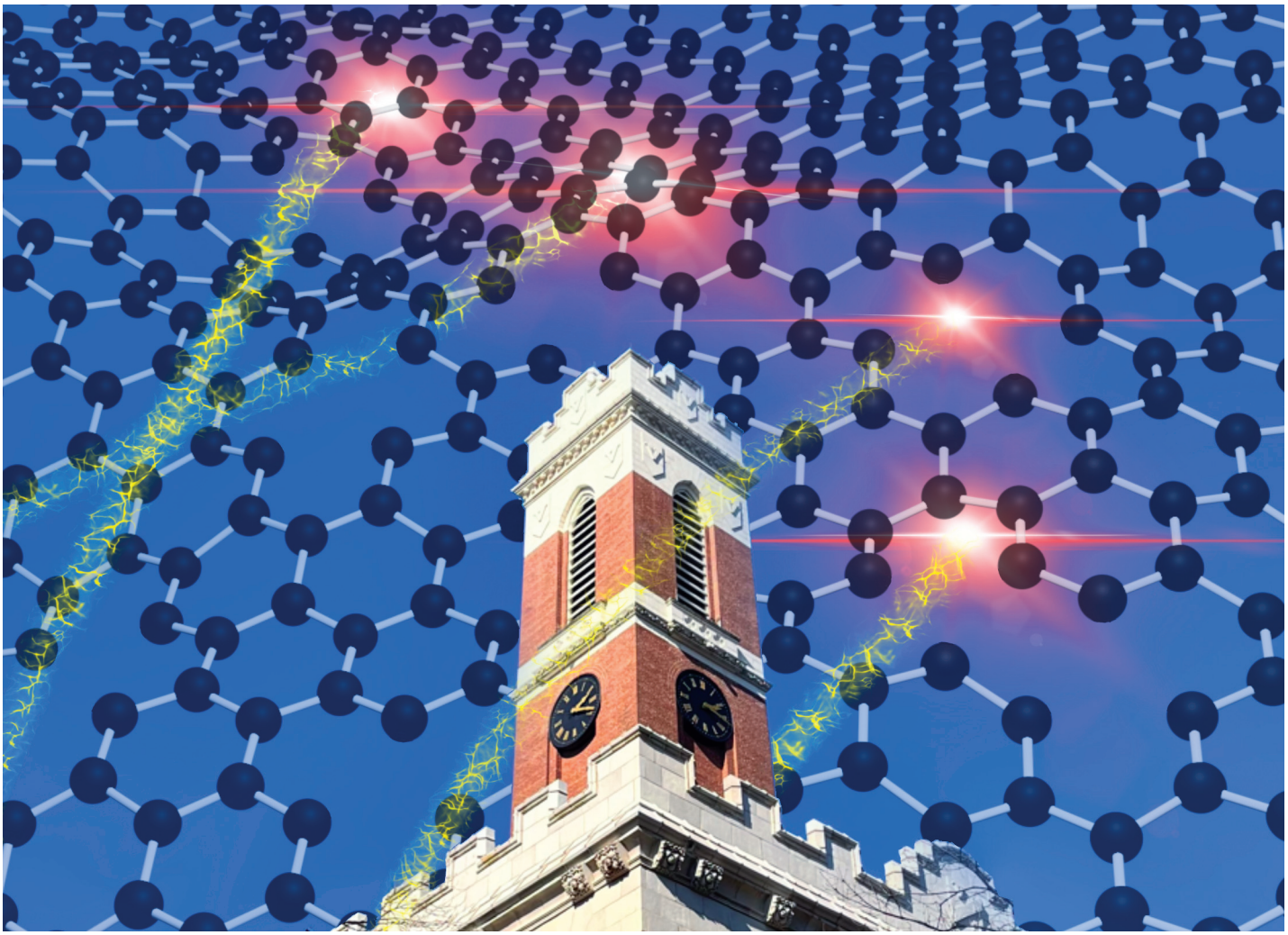

Showcasing work from the group of Professor Piran R. Kidambi at Vanderbilt University, Nashville, USA, for the themed issue celebrating the 150th anniversary of Vanderbilt University.

Ultra-thin proton conducting carrier layers for scalable integration of atomically thin 2D materials with proton exchange polymers for next-generation PEMs

Ultra-thin carrier layers for scalable integration of atomically thin 2D materials with proton conducting polymers are reported for next-generation proton exchange membranes. Spin-coating ~700 nm thin Nafion carrier layer to transfer graphene from the Cu foil growth substrate allows for minimizing micron-scale defects to <0.3% area and ~41–54% reduction in crossover of undesired species while maintaining adequate proton conductance for practical applications. Such approaches present potential for transformative advances in fuel cells, redox flow batteries, isotope separations, electrolysis and hydrogen economy-relevant clean energy technologies.

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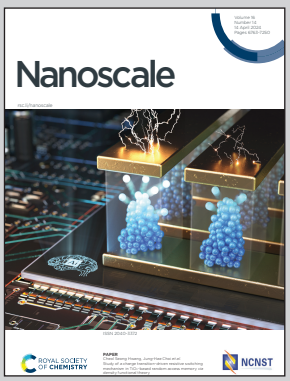

See Piran R. Kidambi *et al.*, *Nanoscale*, 2024, **16**, 6973.

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