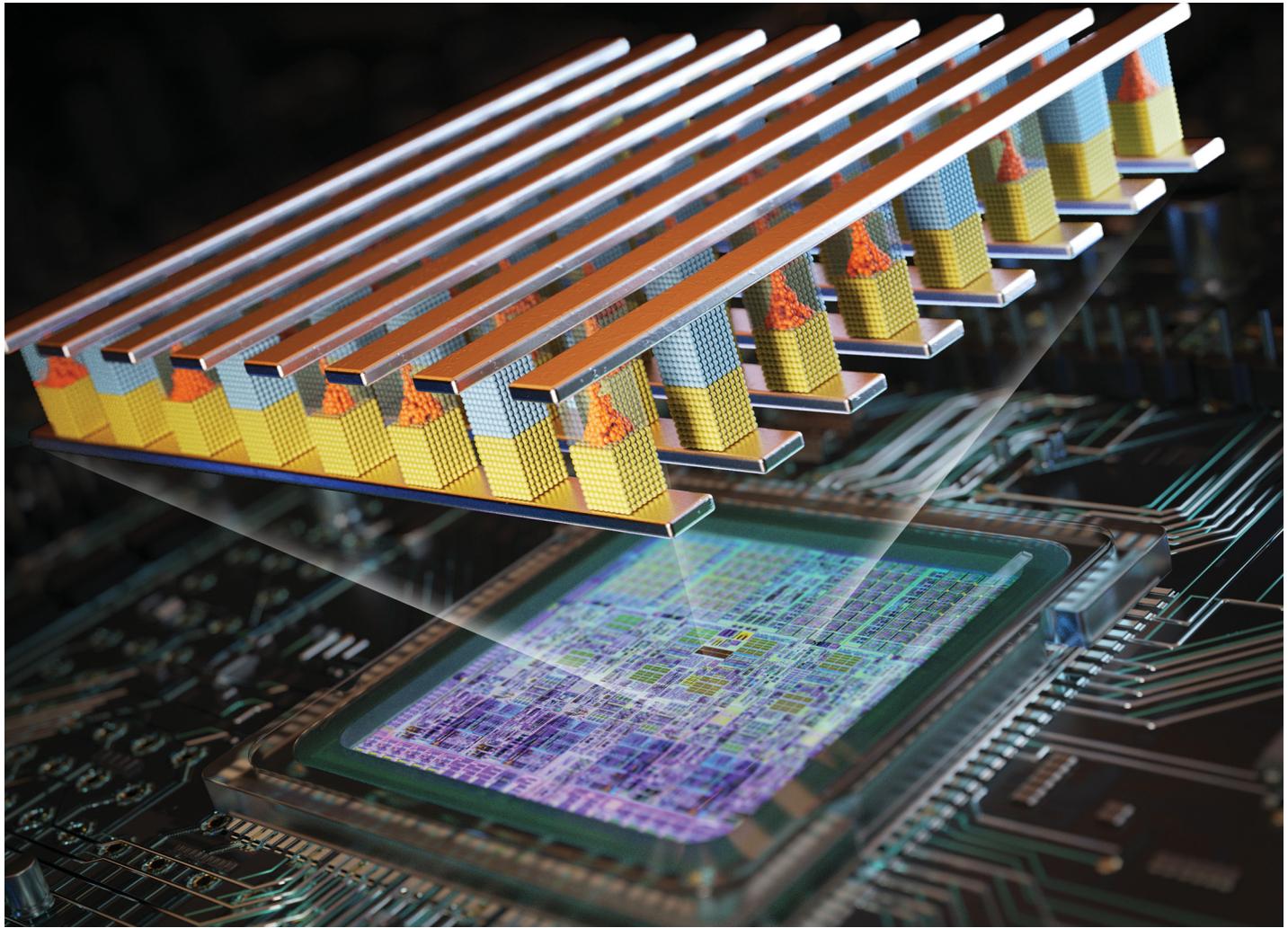**NEW JOURNAL**

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Showcasing research from Professor Cheol Seong Hwang's laboratory, Department of Materials Science and Engineering, Seoul National University, Seoul, Republic of Korea.

Heterogeneous reservoir computing in second-order Ta_2O_5/HfO_2 memristors

This study demonstrates the utilization of a second-order Ta_2O_5/HfO_2 bilayer memristor for reservoir computing, paving the way for electrically reconfigurable reservoirs. Using the electrically tunable heterogeneity induced by oxygen vacancies in the Ta_2O_5 layer and electron traps in the HfO_2 layer, this approach enables fine control over individual reservoir units, leading to enhanced pattern recognition compared to homogeneous reservoir configurations. These findings highlight the compelling potential of second-order memristors with diverse behaviors for more efficient neuromorphic applications.

As featured in:
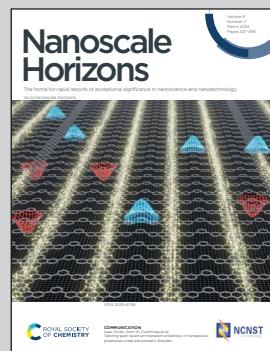
See Kyung Seok Woo, Cheol Seong Hwang *et al.*, *Nanoscale Horiz.*, 2024, **9**, 427.