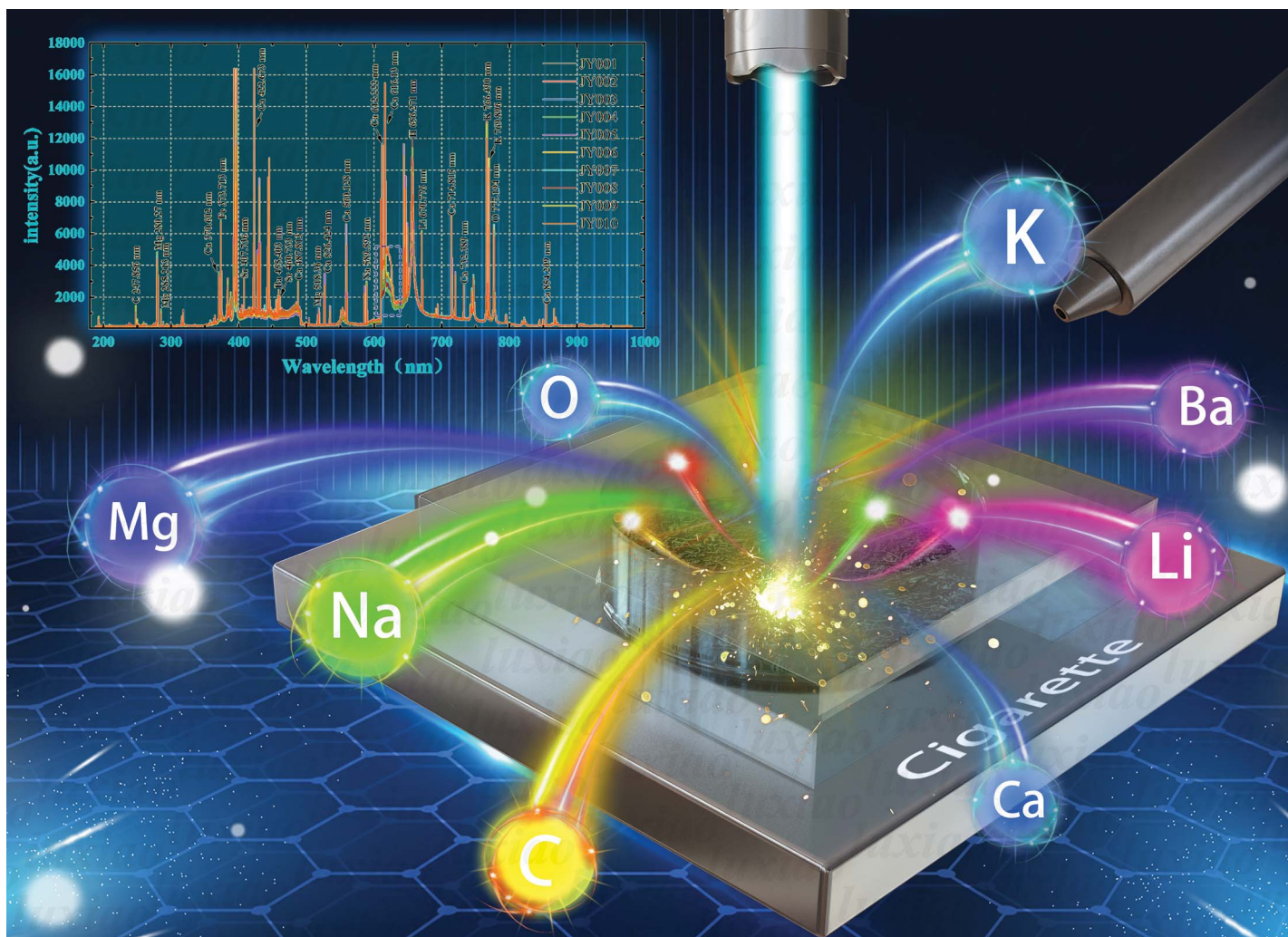


EES Solar

**Exceptional research on solar
energy and photovoltaics**

Part of the EES family

**Join
in** | Publish with us
rsc.li/EESolar



Showcasing research from Professor Xiaojian Hao's laboratory, Science and Technology on Electronic Test and Measurement Laboratory, North University of China, Taiyuan, Shanxi, China.

Cavity-constrained LIBS combined with the gray wolf optimization algorithm for optimizing bidirectional long short-term memory (GWO-BiLSTM) networks for classification prediction of different brands of cigarettes

Traditional cigarette detection methods are time-consuming and subjective, and the analysis results are not objective and precise enough, while this study proposes a combination of cavity-constrained laser-induced breakdown spectroscopy (CC-LIBS) and gray wolf optimization algorithm optimized bidirectional long and short-term memory network (GWO-BiLSTM) to achieve high-precision classification and identification of cigarette samples of different brands, which can effectively solve the traditional tobacco detection methods' technical pain points.

As featured in:



See Xiaojian Hao *et al.*,
J. Anal. At. Spectrom.,
2024, **39**, 2382.