

IMPACT of 2D-3D HETEROINTERFACE on REMOTE EPITAXIAL INTERACTION through GRAPHENE

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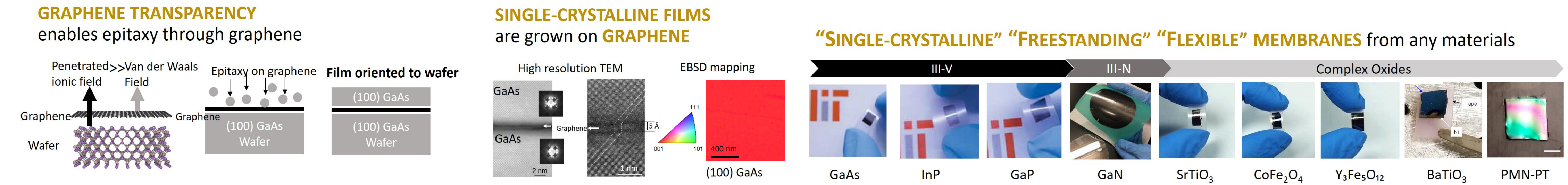
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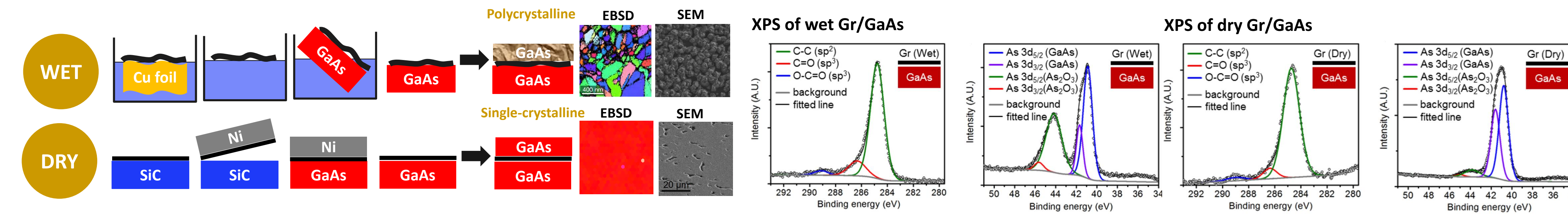


Introduction to REMOTE EPITAXY



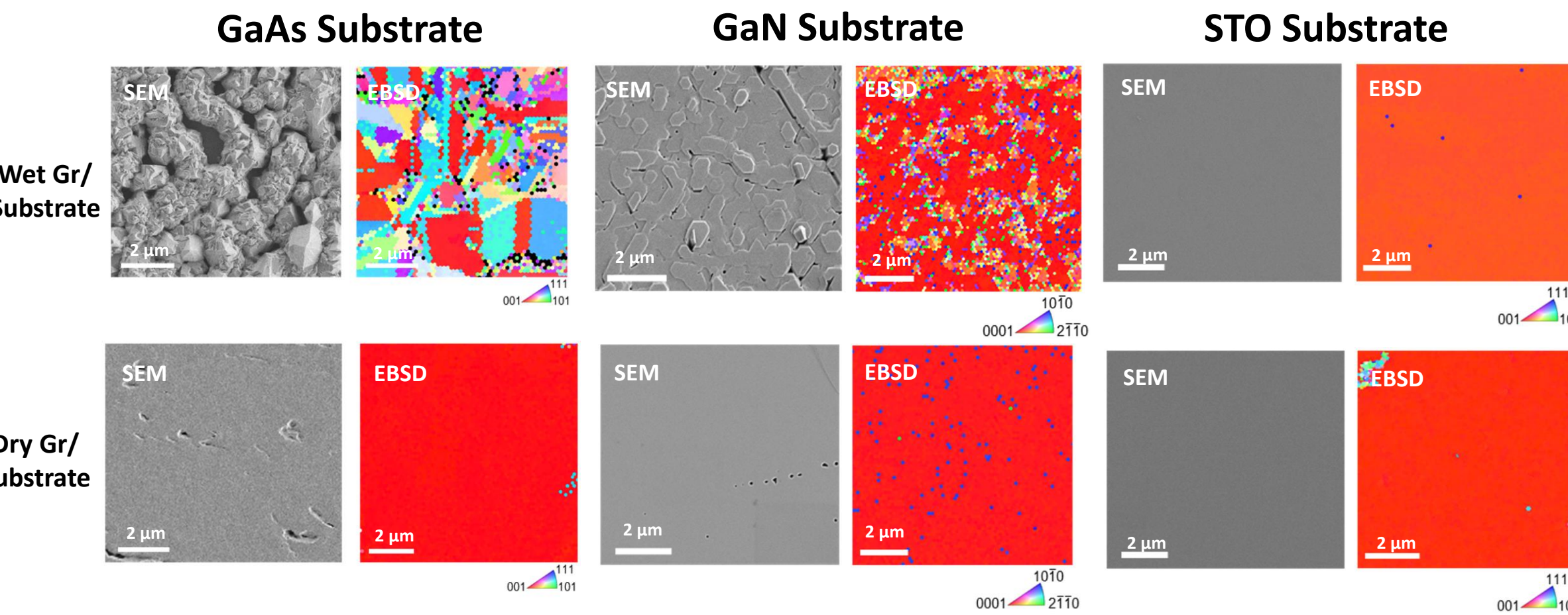
Different 2D-MATERIALS TRANSFER PROCESSES in REMOTE EPITAXY

: SENSITIVITY of REMOTE EPITAXY to Graphene Transfer Conditions



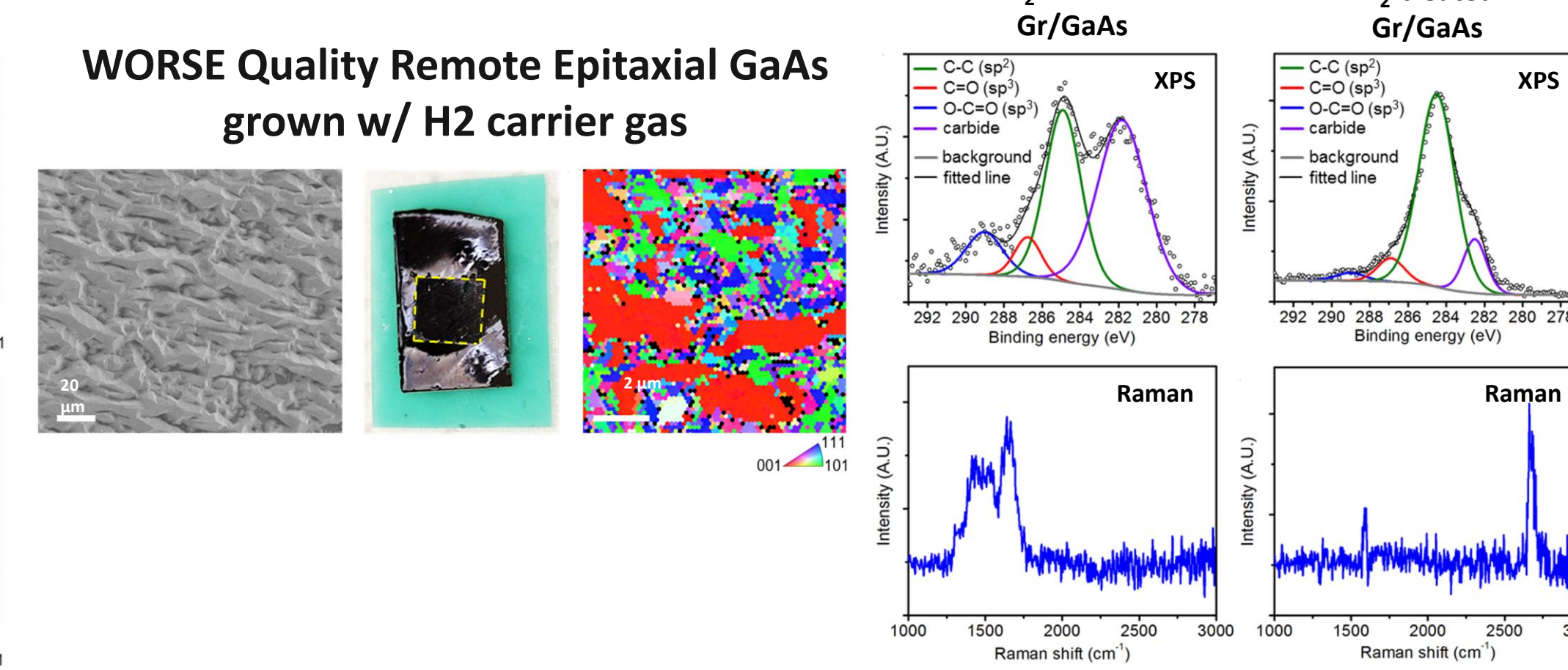
Different 3D-SUBSTRATES EFFECT in REMOTE EPITAXY

: SUBSTRATES' IONICITY MATTERS



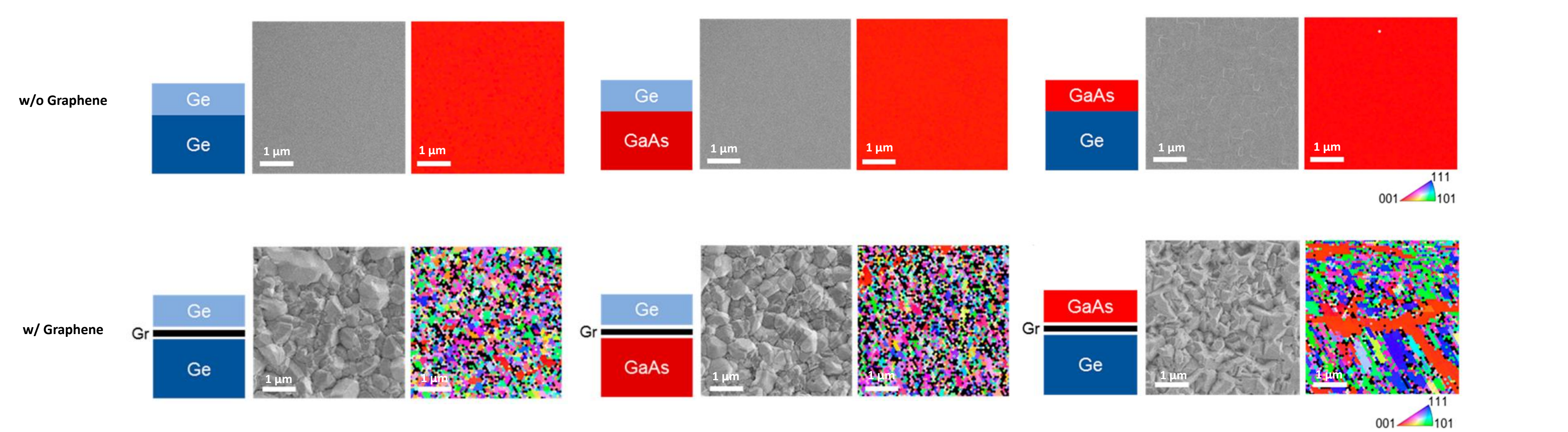
Different EPITAXY CONDITIONS EFFECT in REMOTE EPITAXY

: Choice of CARRIER GAS is IMPORTANT



REMOTE EPITAXY involving ELEMENTAL MATERIALS

: FURTHER PROOF of 2D-MATERIALS QUALITY

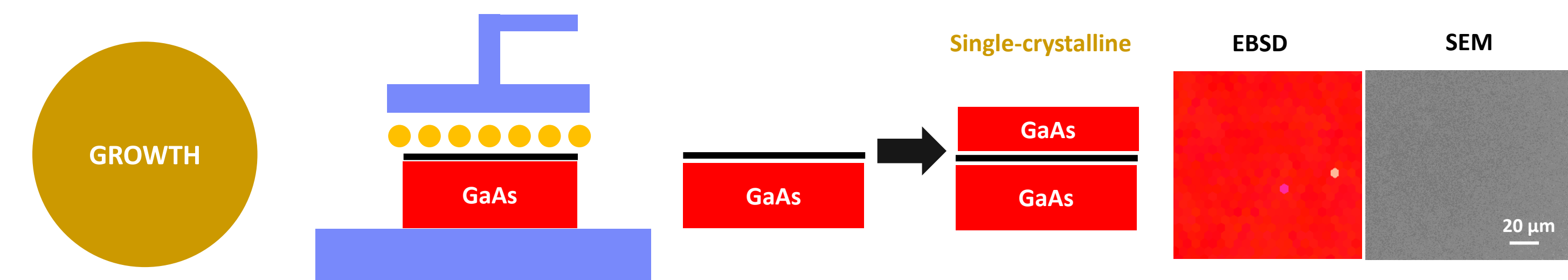


WAFER-SCALE Graphene Growth for REMOTE EPITAXY

: DIRECT GRAPHENE GROWTH on III-V WAFER



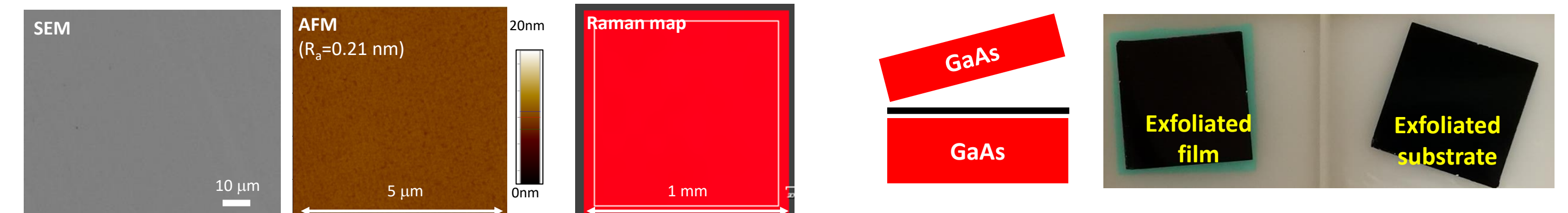
Pristine graphene-GaAs interface Improves morphology



GRAPHENE grown on **GaAs** wafer

EXFOLIATION with pristine wafer

Fully covered graphene grown on GaAs



Acknowledgements:



- H. Kim*, K. Lu* (co-first author), *et al.* Impact of 2D–3D Heterointerface on Remote Epitaxial Interaction through Graphene. *ACS nano* (2021).
- K. Qiao, *et al.* Graphene Buffer Layer on SiC as a Release Layer for High-Quality Freestanding Semiconductor Membranes. *Nano letters* 21.9 (2021): 4013-4020.
- S.H. Bae*, K. Lu* (co-first author), *et al.* Graphene-assisted spontaneous relaxation towards dislocation-free heteroepitaxy. *Nature Nanotechnology* 15.4 (2020): 272-276.
- S.H. Bae, *et al.* Integration of bulk materials with two-dimensional materials for physical coupling and applications. *Nature Materials* 18, 550-560 (2019).
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- Kim, Y., *et al.* Remote epitaxy through graphene enables two-dimensional material-based layer transfer. *Nature* 544, 340-343 (2017).