

Material	E_g (eV)	E_{BD} (MV/cm)	k^2 (100%)
ϵ -Ga ₂ O ₃	4.9	8	15
AlN	4	12	5-7
AlScN	6.2	6.5	2.8
LiNbO ₃	3.3-4.7	0.04	31

Table 1: Piezoelectric material comparison with common FOM, from [1, 2, 3, 4, 5, 6, 7, 8] which includes bandgap (E_g), breakdown electric field (E_{BD}), and electromechanical coupling coefficient (k^2)

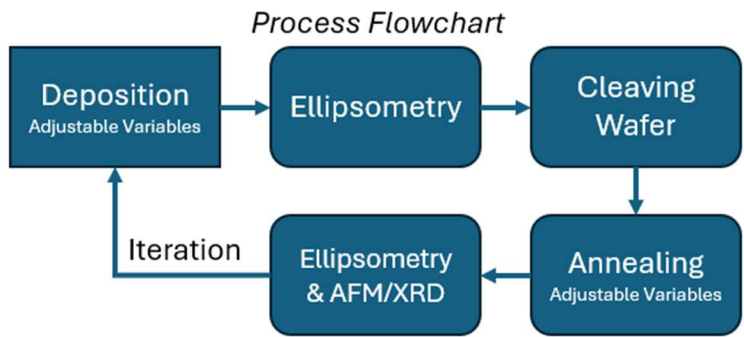


Figure 1: Research approach flowchart

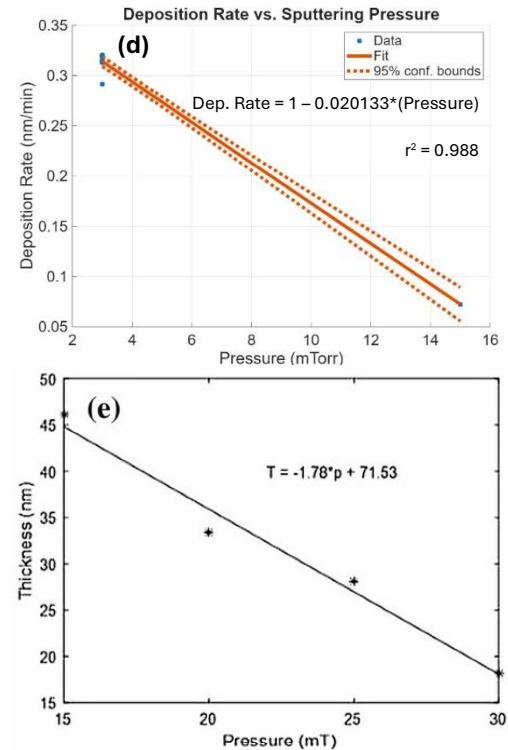


Figure 2: Deposition Rate and thickness, lower Figure 2e from [9]

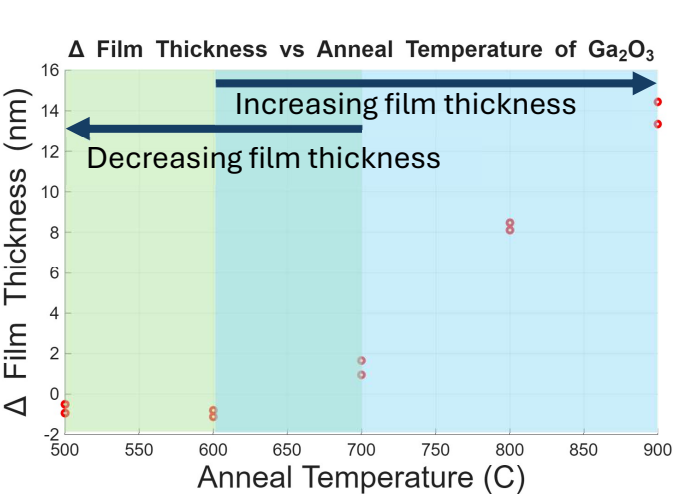


Figure 3: Measured difference in film thicknesses

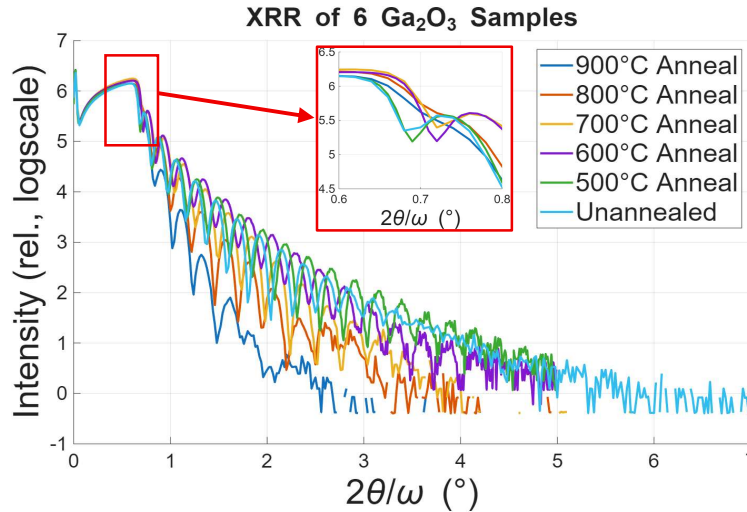


Figure 4: Obtained XRR measurements

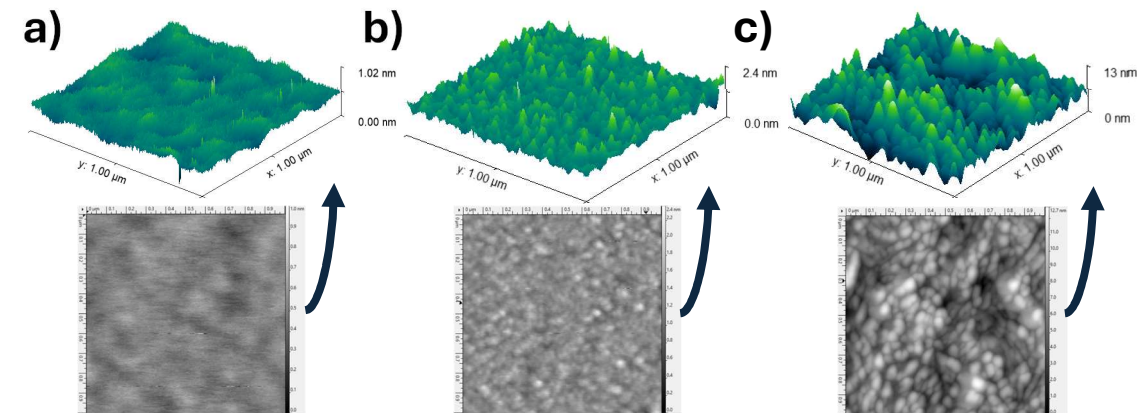


Figure 5: $1\mu\text{m}^2$ 3D-rendered surface topologies generated using Gwyddion and respective top-down views: **a)** unannealed sample (66.59pm RMS surface roughness), **b)** 500°C anneal (161.5pm RMS surface roughness), **c)** 900°C anneal (1.858nm RMS surface roughness)

References:

[1] doi: [10.1016/j.rinp.2022.105736](https://doi.org/10.1016/j.rinp.2022.105736).,

[2] doi: [10.3389/fmech.2022.902421](https://doi.org/10.3389/fmech.2022.902421).,

[3] doi: [10.1063/5.0182451](https://doi.org/10.1063/5.0182451).,

[4] doi: [10.1039/D4MH00551A](https://doi.org/10.1039/D4MH00551A).,

[5] doi: [10.3390/mi14010157](https://doi.org/10.3390/mi14010157).,

[6] doi: [10.1111/jace.20421](https://doi.org/10.1111/jace.20421).,

[7] doi: [10.1038/s41378-025-01053-8](https://doi.org/10.1038/s41378-025-01053-8).,

[8] doi: [10.1007/978-981-97-8265-9_1](https://doi.org/10.1007/978-981-97-8265-9_1).

[9] doi: [10.1007/s11664-018-6746-z](https://doi.org/10.1007/s11664-018-6746-z)