# Engineered Nanoporous Anodic Alumina and Applications

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Nanoporous anodic alumina (NAA) produced by electrochemical oxidation—anodisation—of aluminium is a highly versatile nanomaterial with broad transdisciplinary applicability because of its unique chemical and physical properties, and tailorable nanoporous structure [1]. NAA is a matrix of anodic aluminium oxide featuring extended arrays of straight, cylindrical, nanometric pores homogeneously distributed across its surface in a honeycomb fashion (Figure 1) [2]. This characteristic self-organised porous structure results from an electric field-driven mechano-electrochemical growth mechanism, which can be tailored to engineer NAA platforms with highly versatile properties at the nanoscale for specific applications [3–5]. Our team has been pushing the boundaries of the fundamental mechanisms behind anodisation to further expand the applicability of this ideal platform material across a range of technologies. In this presentation, I will introduce our recent advances in NAA technology—with a particular focus on the development of high-quality forms of NAA-based systems and their application in optical sensing, lasing, catalysis, and iontronics—and our vision for future advances in this highly dynamic and exciting field of research.

## References

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## Figures

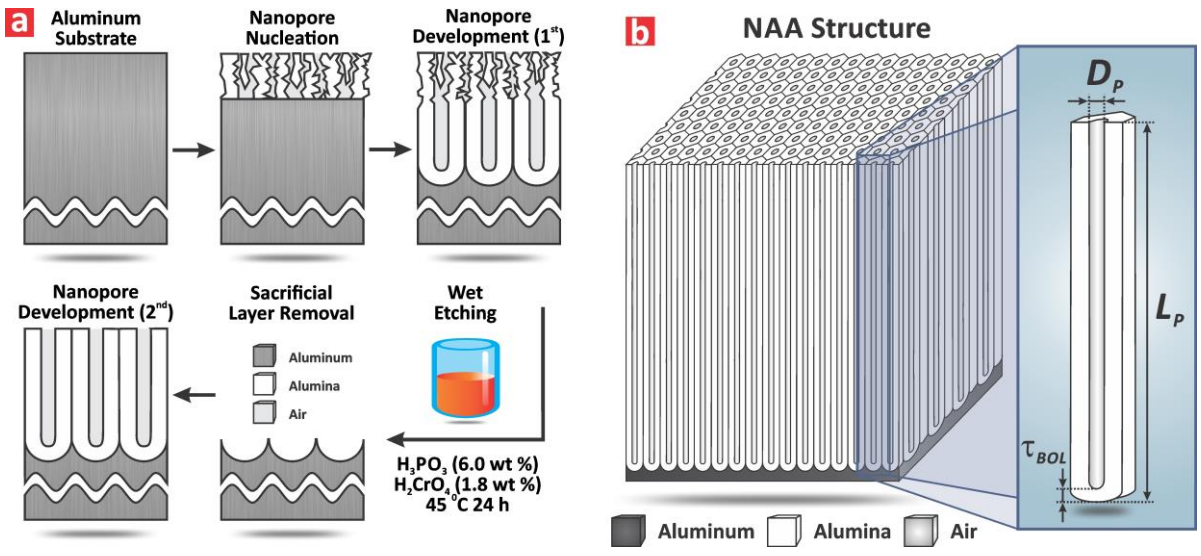


**Figure 1:** (a) NAA fabrication process and (b) basic structure of NAA.