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## Promising thermal barrier coating candidates for next generation gas turbine

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For increasing thermal efficiency and for lowering emissions requires gas turbine designers to further increase the combustion temperature that leads to the need for high temperature components such as combustion chambers, blades and vanes surfaces to face more rigorous conditions. Therefore, there is an urgent demand to develop new ceramic coatings with even lower thermal conductivity, higher stability and durability than currently used thermal barrier coatings coated on the surface of high temperature alloy components. In this presentation, we introduce new class of refractory ceramics as candidate materials for thermal barrier coatings, including the structure design, the rule of introducing defects in the crystal structure to further decrease the thermal conductivity, and to increase the structure stability at high temperature; the idea of suppressing the heat transfer at the high temperature by irradiation; the synthesis process and thermal properties. The mechanical properties at ambient and elevated temperature are also reported.

### Biography

Wei Pan is a Professor and Director of the State Key Lab of New Ceramics and Fine Processing at Tsinghua University, China. He has published more than 170 papers in the journals like *Phys. Rev. Lett.*, *Phys. Rev. B*, *Appl. Phys. Lett.*, *Adv. Mater.*, *Chem. Mater.*, *J. Am. Ceram. Soc.*, *Acta Mater.* etc. He is a Member of the standing-committee of the Chinese Ceramic Society and Editorial Board Member of several international journals. He is also the Fellow of the School of Engineering at the University of Tokyo.

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