Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.

Supporting Information

Toward Color Variation of Long Persistent Luminescence in Pr^{3+}-doped Garnet Transparent Ceramic Phosphors

Qiping Du, Jumpei Ueda,* and Setsuhisa Tanabe*

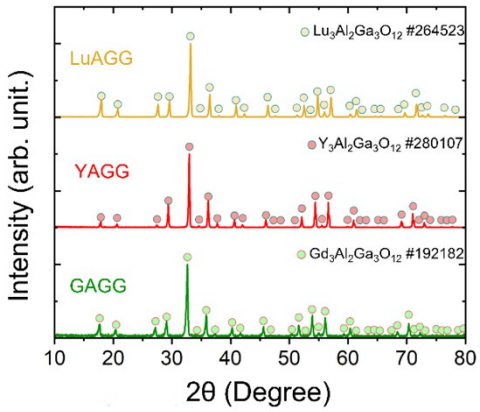

Figure S1. XRD patterns of Pr^{3+}-doped $(Ln)_3Al_2Ga_3O_{12}$ (Ln = Lu, Y and Gd) transparent ceramics.

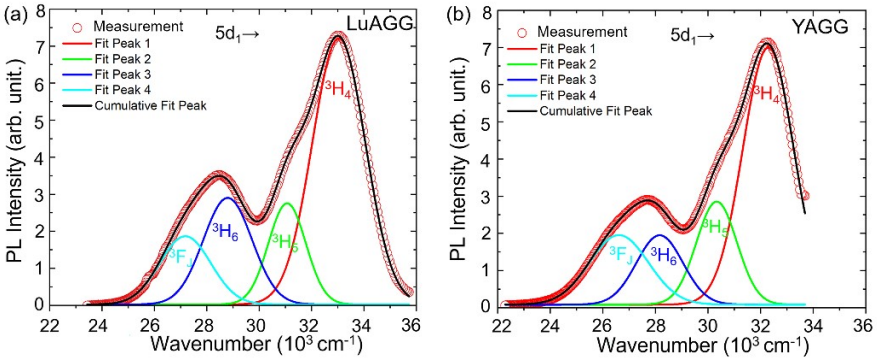

Figure S2. Deconvolution with Gaussian functions of $5d_1$ emission bands of Pr^{3+} in LuAGG and YAGG sample.

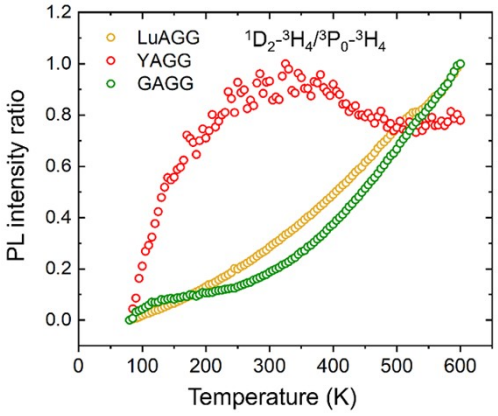

Figure S3. The temperature dependence of normalized emission intensity ratio of $^1D_2$ → $^3H_4$ transition and $^3P_0$ → $^3H_4$ transition in LnAGG: Pr^{3+} transparent ceramics.

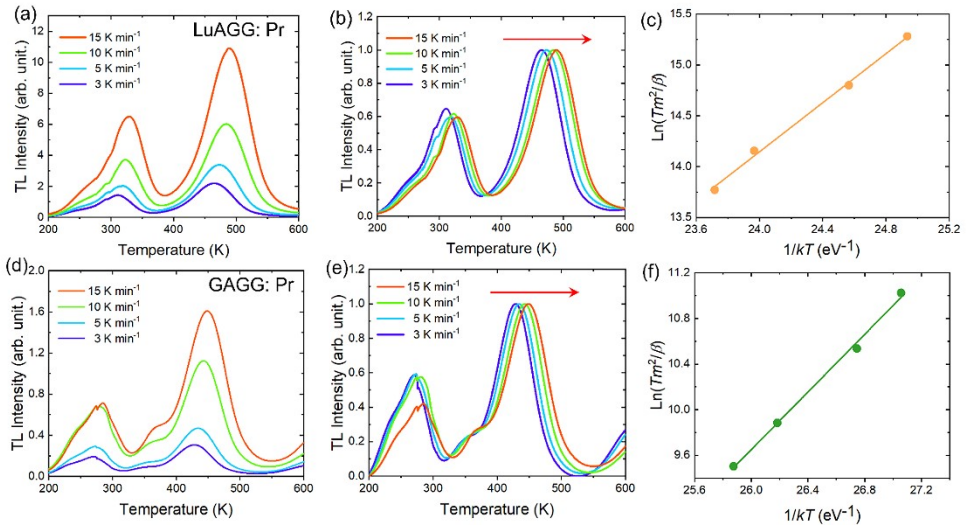

Figure S4. TL glow curves of LuAGG: Pr (a-b) and YAGG: Pr (d-e) at different heating rates (3, 5, 10, 15 K min^{-1}) after UV charging for 5 min. Heating rate plot of LuAGG: Pr(c) and YAGG: Pr (f) to estimate the trap depth.

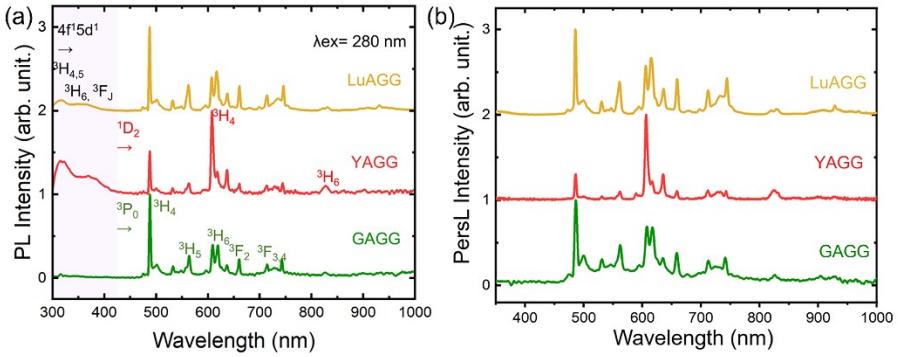

Figure S5. Comparison between PL a) and PersL b) spectra of *Ln*AGG:Pr^{3+} samples.

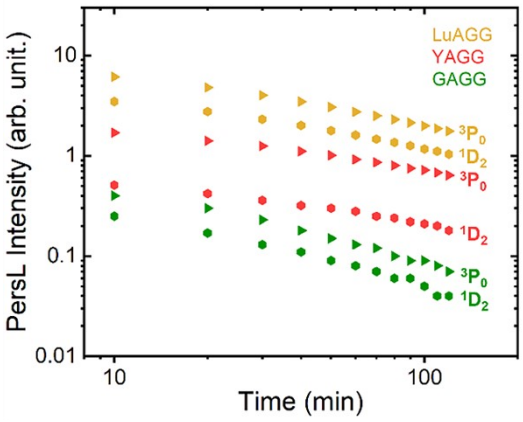

Figure S6. The PersL intensity of $^3P_0 \rightarrow {}^3H_4$ and $^1D_2 \rightarrow {}^3H_4$ transitions with different duration time in *Ln*AGG:Pr^{3+} samples.

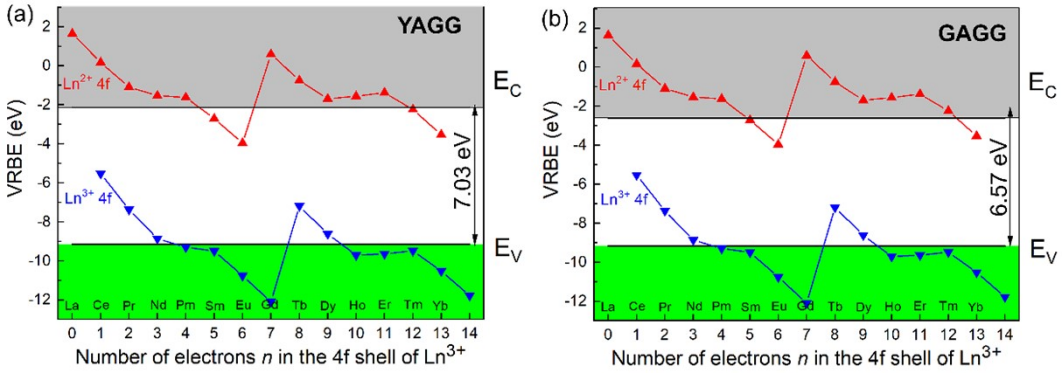

Figure S7. VRBE diagram for YAGG (a) and GAGG (b).

Table S1. The fluorescence decay parameters in LuAGG: Pr^{3+} and YAGG: Pr^{3+}.

	LuAGG: Pr				YAGG: Pr			
Temperature (K)	A_1	τ_1 (ns)	A_2	τ_2 (ns)	A_1	τ_1 (ns)	A_2	τ_2 (ns)
150	276.0	2.8	657.0	12.8	1032.8	16.3		
180	14120.8	2.6	1227.5	12.4	961.5	15.2		
210	73041.6	1.8	1261.7	11.1	960.0	13.6		
240	64350.8	1.9	868.6	12.1	954.1	11.6		
270	402541.8	1.4	822.0	11.6	883.6	9.4		
300					446.9	3.1	519.4	12.5
330					473.6	1.8	466.9	8.9
360					412.1	0.8	599.4	5.1