Electronic Supplementary Material (ESI) for Nanoscale.

Supporting Information

Growth of Metal-Semiconductor Core-Multishell Nanorods with Optimized Field Confinement and Nonlinear Enhancement

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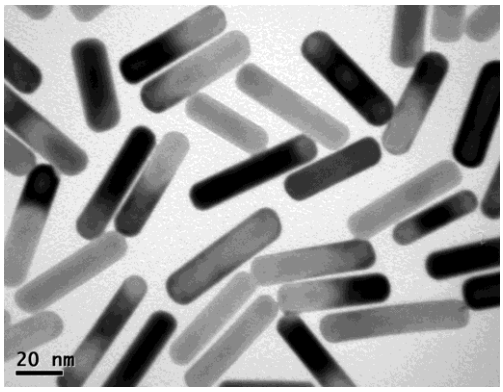

Figure S1. TEM image of the Au nanorods.

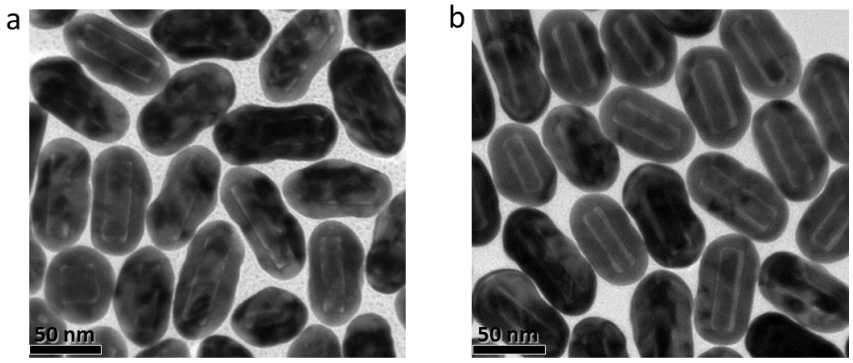

Figure S2. TEM images of Au/AuAg NRs with different gaps distances.

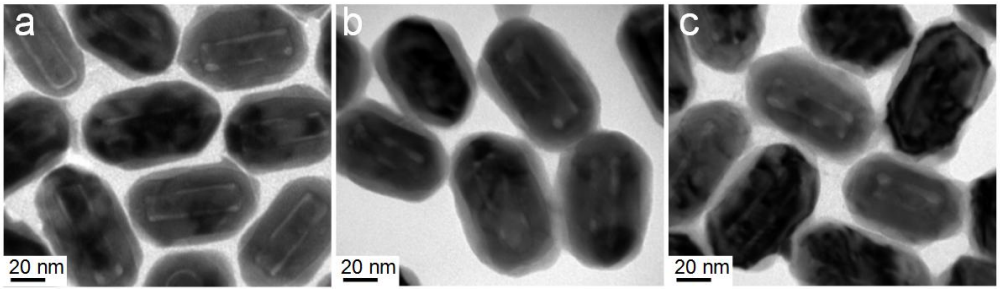

Figure S3. TEM images of Au/AuAg/Ag_2S NRs with different Ag_2S thicknesses.

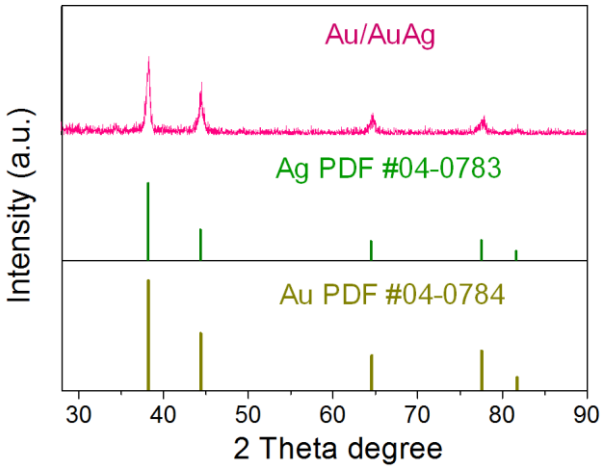

Figure S4. XRD patterns of Au/AuAg, Au (PDF #04-0784) and Ag (PDF #04-0783).

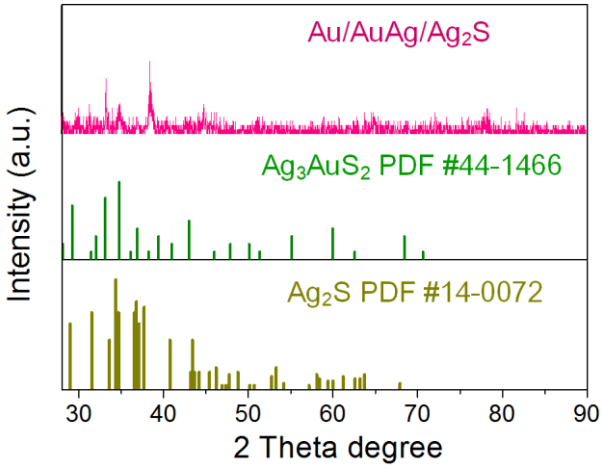

Figure S5. XRD pattern of Au/AuAg/Ag_2S and the standard patterns of Ag_2S (PDF #14-0072) and Au_3AuS_2 (PDF #44-1466).

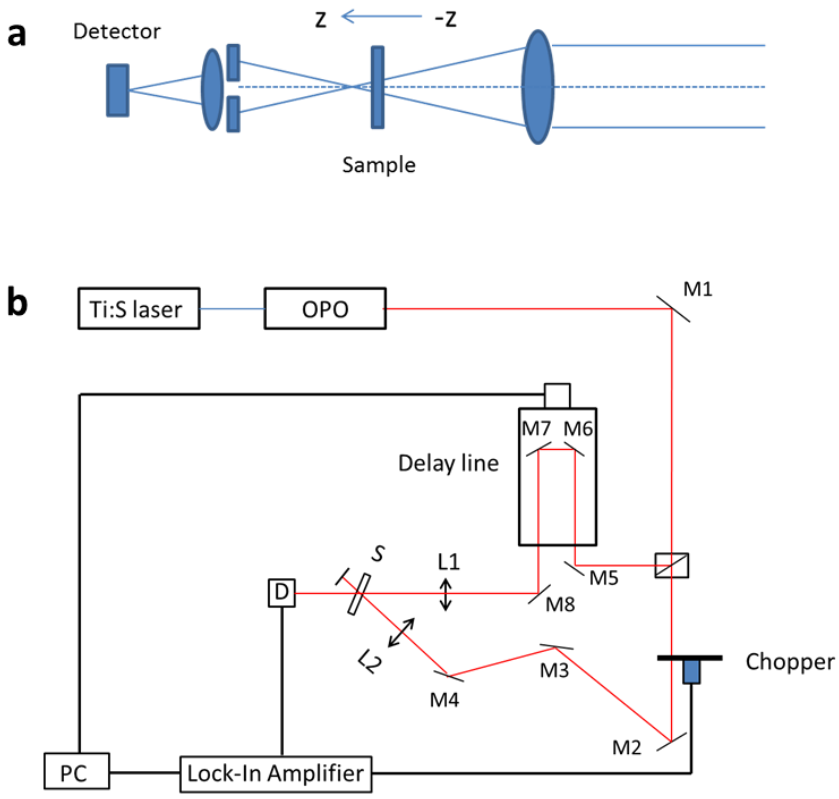

Figure S6. Experimental set-up of Z-scan (a) and Pump-probe measurement (b).

The effective NLA coefficient β_{eff} and the NLR index γ can be calculated by the following relationships:

$$T_{\text{OA}} = \sum_{m=0}^{\infty} \frac{(-q_0)^m}{(1+z^2/z_0^2)^m (1+m)^{3/2}} \qquad (1)$$

$$\frac{T_{\text{CA}}}{T_{\text{OA}}} = 1 + \frac{4\Delta\phi_0 \, z/z_0}{[(z/z_0)^2+9][(z/z_0)^2+1]} \qquad (2)$$

where $q_0 = \beta_{\text{eff}} I_0 L_{\text{eff}}$ and $\Delta\varphi_0 = \gamma k I_0 L_{\text{eff}}$. I_0 is the peak irradiance at the focus (z=0). L_{eff} is the effective thickness of the samples, $k=2\pi/\lambda$ is the wave vector of the laser radiation, z_0 is the Rayleigh length of the Gaussian incident beam.