Electronic Supplementary Material (ESI) for Nanoscale.

Supporting information

Guided Transport of Nanoparticles by Plasmonic Nanowires

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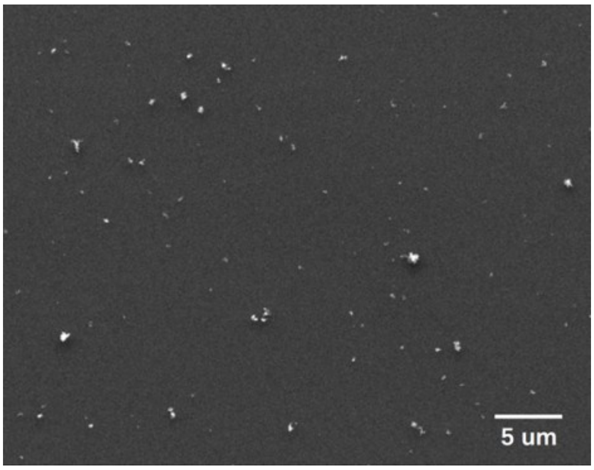

Fig. S1 The SEM image of TiO_2 nanoparticles. The nominal diameter is 42.3 nm. The particles were easily aggregated in aqueous.

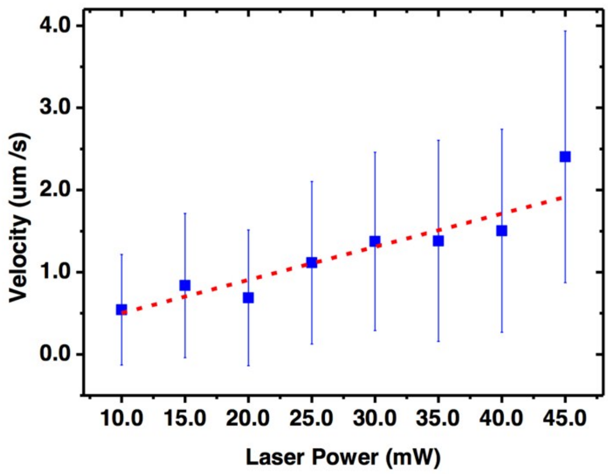

Fig. S2 The relationship between the velocity of nanoparticles and the incident laser power. The blue dots are the experimental results for several particles and the red dash line is the linear fit.

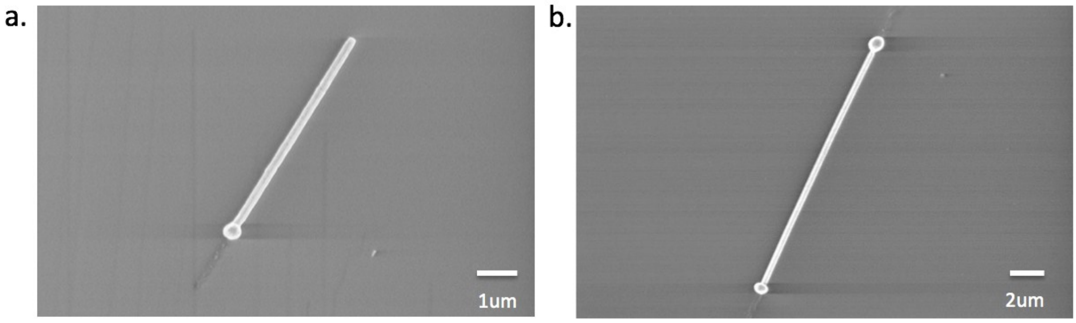

Fig. S3 (a, b) SEM images of silver nanowires' melting and reshaping under the illumination of 1064 nm laser. The laser heating effect of the nanowire can be evidenced by the melting and recrystallization of the terminals of the nanowire. When the power of the 1064 nm laser was increased to 200 mW (before it enters the optical microscope), the incident terminal of the silver nanowire can be melted, and reshaped to a sphere of 500 nm diameter, as shown in Fig. S3 (a, b).

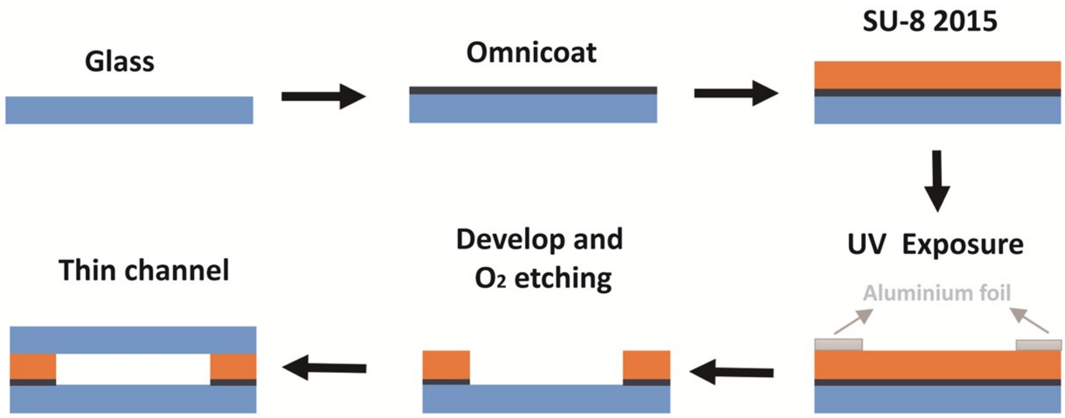

Fig. S4 The process of micro-fabricating thin channel of 10 μm height. An adhesive layer (Omnicoat) and the photoresist (SU-8) was coated on a cleaned glass substrate by spin-coating. The height of the cell is determined by the thickness of SU-8. Then the ultraviolet (UV) ray was used to etch SU-8. The sample was transferred to the developer and fixer bath, then washed by deionized water. Reactive Ion Etching (RIE) was used to clean the channel before coating the top glass slide.

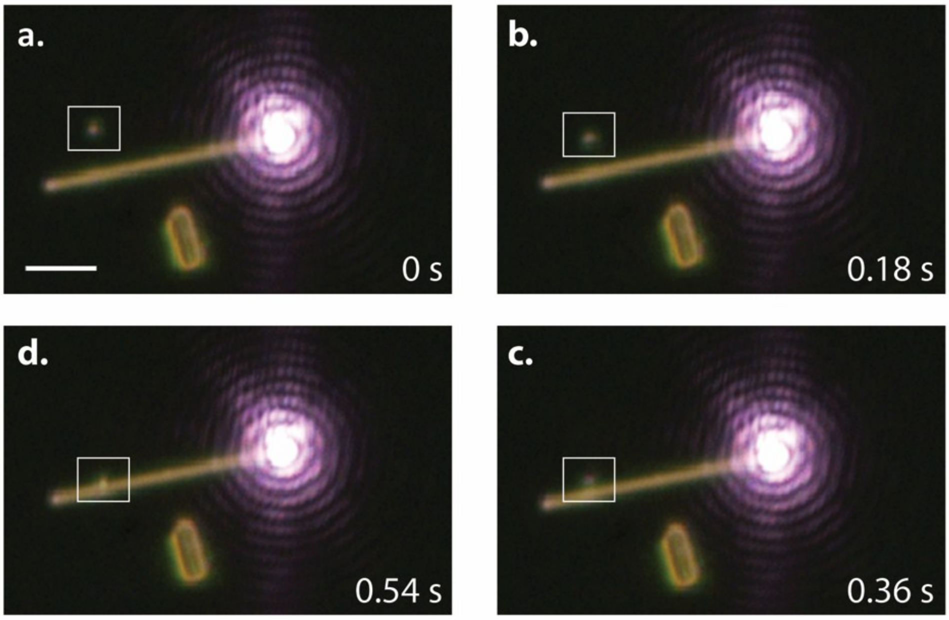

Fig. S5 The optical trapping of TiO_2 nanoparticles by a silver nanowire in the thin channel of 10 μm in height, which was measured by surface profilers. The 1064 nm laser illuminated at the right end of Ag nanowires. The white square shows the position of the TiO_2 nanoparticle. A movement of the trapped nanoparticle was not observed. The scale bar is 500 nm.

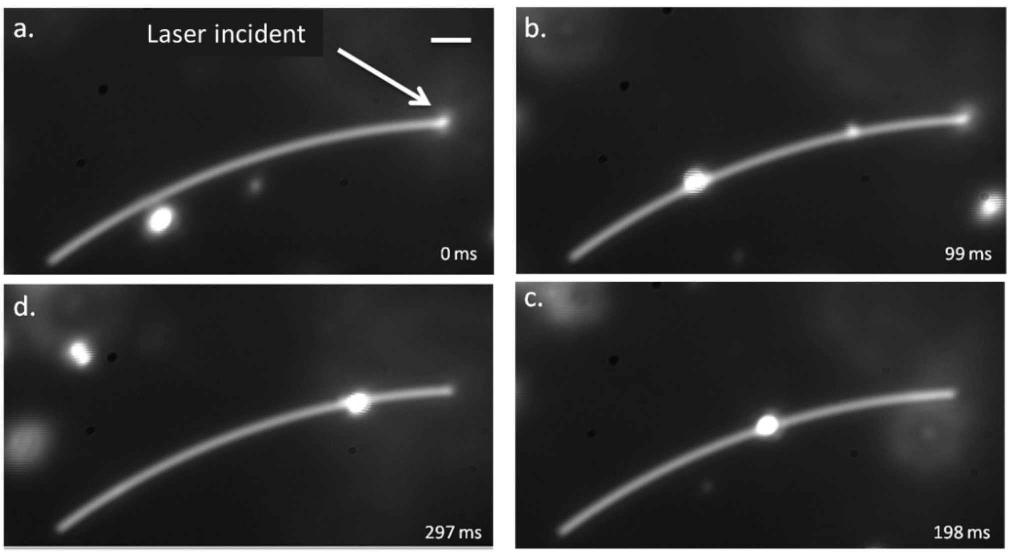

Fig. S6 Experimental results of nanoparticles' movement along a curved silver nanowire. The white arrow in Figure 6 (a) highlights the incident end of the laser illumination. The scale bar is 0.5 μm and the laser power was 75 mW. (a - d) A serial of DF images showing the movement of a TiO_2 particle (or cluster) along the nanowire.

Movie 1 shows the optical trapping and movement of TiO_2 nanoparticles by a silver nanowire (Figure 2 in the main text). The time interval between frames was 0.3 s. **Movie 2** shows the selective trapping and movement of TiO_2 nanoparticles by switching the polarization of the incident laser on a V-shaped nanowire (Figure 5 in the main text). The time interval between frames was 33 ms.