On page 3511, Paleari, Brovelli, and co-workers report the first example of electric-responsive nanostructured glass. Electrically tunable switching is activated by a percolating charge-transport mechanism in SiO$_2$ films that contain suitable dispersions of SnO$_2$ nanocrystals (blue), with conductive substoichiometric interfaces (cyan), obtained through a new solution-based synthetic strategy. Switching of semiconducting nanophases to charged polarisable states promises smart materials for applications in nanophotonics and plasmonics.