1. Name: ***Dr. K. K. SAINI***

2. Designation and Present Institution (different lines separated by commas):

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7. Brief account of your research interests with special focus on Nano Science and Technology (strictly within 300 words):

I am fabricating nanocrystalline TiO_2 powder and films pure and doped with metal different metal cations by sol-gel technique. We developed scratch resistant films of TiO_2 on large area glass substrates by sol-gel dip coating process and modified the photocatalytic properties of these films so as to develop self cleaning glass for architectural use. We applied for grant of patent on this process.

Presently we are coating nanocrystalline films of titanium oxide, niobium oxide, presodimium calcium manganese oxides etc by sol-gel technique on small area semiconductor and other substrates with pre-coated metal electrodes and studying & tailoring the properties of these films for resistive memory applications: which are potential candidates of new generation memory applications to replace the existing CMOS devices? We have obtained encouraging results in such devices fabricated with TiO2. Soon we shall fabricate and study such devices fabricated from Nb_2O_5 and PCMO.

We are also engaged in developing the nanocrytals of TiO_2, PbS, PbSe etc for application in injection solar cells. The aim is to improve the efficiency of this solar cell and also to replace the organic dye with inorganic nanocrystals of PbS & PbSe. Nanocrystallite size of PbS and PbSe has to be tuned to suitable value so that they can efficiently inject the photo-generated electron into the conduction band of TiO_2.

I am also taking regular course classes of nano-technology subject as subject in M. Tech (VLSI) 3rd semester of IP university for the last two years.

Research publications in SCI journals:- 27

Papers in international workshop/conference/symposia: 24

Externally funded projects completed (DST, DBT, DRDO) 7

Patents granted -1, applied - 1

8. Keywords related to your research interests (maximum 10, different lines separated by commas).

Resistive Memory, nano-technology, nano-particles TiO2, PbS, Au, PbSe, Ag, charge injection, solar cell, self cleaning, photoactivity, sol-gel, nano-sphere lithography, single electron transistor (SET).