

PhD in SCIENZE E TECNOLOGIE ENERGETICHE E NUCLEARI / ENERGY AND NUCLEAR SCIENCE AND TECHNOLOGY - 40th cycle

THEMATIC Research Field: ZN-IV-N2 FILMS DEPOSITED BY HIPIMS FOR PHOTOVOLTAIC APPLICATIONS

€ 1500.0	Monthly net income of PhDscholarship (max 36 months)		
	€ 1500.0		
In case of a change of the welfare rates during the three-year period, the amount could be modified.			

Con	text of the research activity
Motivation and objectives of the research in this field	 The design, production, and characterization of novel and alternative materials is a crucial point for the development of next-generation photovoltaic systems. In this respect, IV nitrides (e.g. ZnSnN2) are made of earth-abundant, cheap, and non-toxic elements, characteristics that make them an excellent candidate for sustainable photovoltaic applications. Through an experimental approach the PhD project focuses on the study of Zn-IV-N2 films exploiting the features of the High Power Impulse Magnetron Sputtering deposition technique. The considered aspects will be: 1. deposition and characterization of films and coatings tailored at the nanoscale; 2. understanding the role of process parameters on the features of the grown film; 3. evaluation of the coatings features in terms of carrier density, mobility, band gap and optical properties. The study is supported by RSE S.p.A.
Methods and techniques that will be developed and used to carry out the research	The foreseen research on coatings will be focused on the use of PVD techniques, more specifically High Power Impulse Magnetron Sputtering. In addition to the deposition techniques different characterizations such as SEM, EDXS, Raman, UV-Vis and conductivity tests will be



	used. A full electrical and optical characterization will be carried on thorough collaborations with national and international partners.
Educational objectives	Education of people to be launched in the world of research and high technology industry in the fields of physics and engineering of materials, able to manage interdisciplinary issues, perform and interpret complex experiments and produce new equipment.
Job opportunities	Private and public R&D. Highly qualified positions in a wide range of industries related with production, development, and use of advanced materials. The present research will be performed in collaboration with national and international partners in addition to RSE S.p.A.
Composition of the research group	3 Full Professors 3 Associated Professors 1 Assistant Professors 18 PhD Students
Name of the research directors	David Dellasega

Contacts
David Dellasega
Phone 02/2399 6346
Email david.dellasega@polimi.it, phd-STEN@polimi.it

Additional support - Finan	cial aid per PhD student per year (gross amount)
Housing - Foreign Students	
Housing - Out-of-town residents (more than 80Km out of Milano)	

Scholarship Increase for a period abroad		
Amount monthly	750.0 €	
By number of months	6	

POLITECNICO DI MILANO



Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information

Educational activities:

Financial aid per PhD student is available for purchase of study books and material, funding for participation in courses, summer schools, workshops and conferences, instrumentations and computer, etc. This amount is equal to 10% of the annual gross amount, for 3 years.

Teaching assistantship:

Availability of funding in recognition of supporting teaching activities by the PhD student. There are various forms of financial aid for activities of support to the teaching practice. The PhD student is encouraged to take part in these activities, within the limits allowed by the regulations.

Computer availability: individual use.

Desk availability: individual use.