# RAMESH CHANDRA MALLIK, PhD

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## Education and training:

M.Sc (Physics, Specialization: Solid State Physics): Berhampur University, Ganjam, Orissa, India (1998)

PhD (Physics: Department of Physics, Indian Institute Technology, Madras, Chennai, Tamilnadu: (2005)

Postdoctoral Research Fellow: Department of Materials Science and Engineering, Chungju National University, 123 Geomdan-ri Iryu-myeon, Chungju Si, Chungcheongbuk-Do, 380-702, Republic of Korea ( 2005-2006).
Responsibility: Research and Development (Synthesis and Characterization of Bulk Skutterudite Materials for Thermoelectric Application under supervision of Prof. Il-Ho Kim)

Marie Curie Postdoctoral Research Fellow: German Aerospace Centre (DLR), Institute of Materials Research, Linder Hoehe, Geb. 51, D-51147 Köln, Germany (2006-2008)
Responsibility: Research and Development (Nano Layer Thin film for Thermoelectric Application under supervision of Prof. Eckhard Mueller)

## Work experience:

I am working as Assistant Professor in department of Physics, Indian Institute of Science, Bangalore on 31st October 2011 till date.

## Previous Work experience:

I was working as a Lecturer in department of Physics, Indian Institute of Science, Bangalore on 31st October 2008 to 30$^{th}$ October 2011.

## Awards and Fellowships:

- Marie Curie International Incoming Fellowship (MCF-IIF) for 2005 for postdoctoral research work.
- Student Award in International Conference on Metallurgical Coatings and Thin Films “ICMCTF-2003” (28 April- 02 May, 2003), San Diego, California, U.S.A

## Research Interest:

Material Science, Nano Technology, Thin Films, Thermoelectric Materials and Devices

**Research Topic**

1: Filling and doping effect on thermoelectric properties of $Co_4Sb_{12}$ Skutterudite

2: Inclusion of foreign element in PbTe host matrix

3: Thermoelectric properties of doped ternary and quaternary chalcogenide materials

4: Seebeck coefficient of bulk and quantum wells of non-parabolic Kane-type material

5: Contact material for thermoelectric device

6: Ageing and diffusion study on thermoelectric material

Selected Research Publications: Papers Published / to be Published in International Journals


1. Anbalagan R, G. Rogl, Esmaeil Royanian, Patrick Heinrich, Ernst Bauer, Peter Rogl, Satyam Suwas and **Ramesh Chandra Mallik**, Thermoelectric Properties of $Fe_{0.2}Co_{3.8}Sb_{12-x}Te_x$ Skutterudites, submitted to Acta Materialia (2013) *under review.*
2. Ch. Raju, M. Falmbigl, P. Rogl, P. Heinrich, E. Royanian, E. Bauer, Satyam Suwas and **Ramesh Chandra Mallik,** Effect of multi substitution on the thermoelectric properties of chalcogenide based $Cu_{2.1}Zn_{0.9}Sn_{1-x}In_xSe_4$ ($0 \le x \le 0.1$), *physica status solidi (a) (2013) under review.*
3. Ashoka Bali, Esmaeil Royanian, Ernst Bauer, Peter Rogl, and **Ramesh Chandra Mallik**, Thermoelectric properties of PbTe with encapsulated bismuth secondary phase, *J. Appl. Phys,* 113, 123707 (2013).
4. **R C Mallik**, R Anbalagan, KK Raut, A Bali, E Royanian, E Bauer, G Rogl, P Rogl, Thermoelectric properties of Bi-added Co4Sb12 skutterudites, Journal of Physics: Condensed Matter 25 (10), 105701 ( 2013)
5. C Raju, M Falmbigl, P Rogl, X Yan, E Bauer, J Horky, M Zehetbauer, and **Ramesh Chandra Mallik**, Thermoelectric properties of chalcogenide based $Cu_{2+x}ZnSn_{1-x}Se_4$, AIP Advances 3 (3), 032106-032106-12(2013).
6. **Ramesh Chandra Mallik**, Eckhard Mueller and Il-Ho Kim, Thermoelectric Properties of Indium filled and Germanium doped $Co_4Sb_{12}$ Skutterudites, Appl. Phys.111, 023708 (2012); doi: 10.1063/1.3677982
7. S. Bhattacharya and **Ramesh Chandra Mallik**, Electrical Resistance in PbTe Quantum Wires, under review in *J. Electron. Mater (2012)* DOI: 10.1007/s11664-012-1930-z.
8. S. Bhattacharya and **Ramesh Chandra Mallik,** "Seebeck Coefficient in Non-parabolic Bulk Materials" *J. Electron. Mater, 40, 1221-1232* (2011). DOI: 10.1007/s11664-011-1610-4
9. S. Bhattacharya and **Ramesh Chandra Mallik,** "Diffusive thermoelectric power in highly asymmetric bilayer graphene nanoribbons" *J. Electron. Mater 40, 1181-1189* (2011) DOI:10.1007/s11664-011-1585-1

10. S. Bhattacharya and **Ramesh Chandra Mallik,** "Seebeck Coefficient in Bulk and Quantum Wells of Non-Parabolic Kane-Type Materials," JOURNAL OF COMPUTATIONAL AND THEORETICAL NANOSCIENCE, USA, Vo.8, No.4 , P 746-756 (2011).
11. **Ramesh Chandra Mallik**, Christian Stiewe, Gabriele Karpinski, Ralf Hassdorf, Eckhard Müller, Thermoelectric Properties of $Co_4Sb_{12}$ Skutterudite Materials with Partial In Filling and Excess In Addition , *J. Electron. Mater 38, 1337-1343 (2009).*
12. **Ramesh Chandra Mallik,** Jae-Yong Jung, Soon-Chul Ur and Il-Ho Kim, Transport Properties of Sn-filled and Te-doped $CoSb_3$ Skutterudites, METALS AND MATERIALS International, Vol. 14, No. 5 (2008), pp. 615~620
13. **Ramesh Chandra Mallik,** Jae-Yong Jung, Soon-Chul Ur and Il-Ho Kim, Thermoelectric Properties of $In_zCo_4Sb_{12}$ Skutterudites, METALS AND MATERIALS International, Vol. 14, No. 2 (2008), pp. 223~228
14. **Ramesh Chandra Mallik,** Jae-Yong Jung, V. Damodara Das, Soon-Chul Ur and Il-Ho Kim, Thermoelectric properties of $Sn_zCo_8Sb_{24}$ skutterudites by, *Solid State Communications*, 141, (2007), 233-23.
15. **Ramesh Chandra Mallik** and V. Damodara Das, Study of Structural, Compositional, Thermoelectric and Electrical Properties of $Bi_{93}Sb_7$ Alloy Thin Films by *J. Appl. Phys*. **98**, 023710 (2005).
16. **Ramesh Chandra Mallik** and V. Damodara Das, Growth of Bi-Sb Alloy Thin Films and their Characterization By TEM, PIXE and RBS ***Solid State Communications*** *134* (2005) 221- **216**.
17. **Ramesh Chandra Mallik** and V. Damodara Das, Size And Temperature Dependent Thermoelectric and Electrical Properties of $Bi_{88}Sb_{12}$ Alloy Thin Films, *Vacuum* 77(2005) 275-285.
18. V.Damodara Das and **Ramesh Chandra Mallik,** Determination of Nature of Principal Scattering Mechanism in well-Annealed Vacuum Deposited Thin Films of Ternary Thermoelectric Material $Bi_2(Te_{0.8}Se_{0.2})_3$ , *Thin Solid Films*, 424 (2003) 75-78.
19. V. Damodara Das and **Ramesh Chandra Mallik,** Study of Scattering of charge carriers in thin films of $(Bi_{0.25}Sb_{0.75})_2Te_3$ Alloy with 2% Excess Te, *Material Research Bulletin* 37(2002)1961-1971.
20. V. Damodara Das and **Ramesh Chandra Mallik**, Thermoelectric behaviors of $(Bi_{0.5}Sb_{0.5})_2Te_3$ Semiconducting Alloy Thin Films, *Solid State Communications* 120(2001) 217-220.