


## Brief Biodata

**Name: Dr. M. Saravanan**

Designation:	Principal Scientist	
DP No. and Name:	4.03/ Advanced Carbon Products & Metrology	
DU No. and Name:	4/ Advanced Materials & Device Metrology	
Email:	saranm@nplindia.org	
Date of Joining CSIR-NPL:	08 March 2007	
Phone ( <i>office</i> )	91-11-45609472	

### Research Area/ Interest

Advanced Materials and Materials Technology  
Thermoelectric Materials  
Mechanical Testing  
Materials Metrology

### Educational Qualifications

(Please write latest qualification first)

Degree	Subject	University/ Institute	Year
Ph.D.	Thermoelectric materials	Delhi Technological University, Delhi.	2018

### Academic / Research Experience

Grade / Post	Institute	Duration		Research Field
		From	To	
Junior Scientist	CSIR-National Physical Laboratory	08-03-2007	07-03-2010	Engineering Materials
Scientist	CSIR-National Physical Laboratory	08-03-2010	07-03-2015	Thermoelectric Materials
Senior Scientist	CSIR-National Physical Laboratory	08-03-2015	07-03-2019	Thermoelectric Materials
Principal Scientist	CSIR-National Physical Laboratory	08-03-2019	Present	Materials Testing & Metrology and Thermoelectrics

## No. of Publications

No. of Publications in SCI Journals	No. of Publications in non-SCI Journals	No. of Publications in Conference Proceedings	Books	Total
35	5	5	1 (Chapter)	46

## Selected Publications

- 1) *Process-structure-properties relationship in low-cost thermoelectric iron silicide synthesis*  
**Priyanka, Saravanan Muthiah**  
2022, *Ceramics International*, 48 (19B), 29366-29371.
- 2) *Nanostructure Approach Enhancing the Thermoelectric Performance of a p-Type HMS-CrSi<sub>2</sub> Composite Synthesized by the MS-SPS Technique*  
**C Prajapati, Saravanan Muthiah, M Navaneethan, NK Upadhyay, Radhey Shyam, Sanjay R Dhakate**  
2022, *ACS Applied Energy Materials* 5 (4), 4698-4706.
- 3) *Enhancement of Power Factor and Mechanical Properties in Low Cost Mg<sub>2</sub>Si<sub>1-x</sub>Sn<sub>x</sub> Employing a Composite Approach*  
**S Choudhary, Saravanan Muthiah, SR Dhakate**  
2022, *ACS Applied Energy Materials* 5 (1), 549-556.
- 4) *Process optimisation enhancing thermoelectric and mechanical performance in reactive in-situ spark plasma sintered Mg<sub>2</sub>(Si, Sn)*  
**S Choudhary, Saravanan Muthiah, SR Dhakate**  
2020, *Materials Research Bulletin* 128, 110875.
- 5) *Significant enhancement in thermoelectric performance of nanostructured higher manganese silicide synthesized employing melt spinning technique*  
**Saravanan Muthiah, R.C. Singh, B.D. Pathak, P.K. Avasthi, R. Kumar, A. Kumar, A.K. Srivastava, Ajay Dhar.**  
2018, *Nanoscale*, 10(4), 1970-1977.
- 6) *Mechanical properties of thermoelectric n-type magnesium silicide synthesized employing in situ spark plasma reaction sintering*  
**Saravanan Muthiah, R.C. Singh, B.D. Pathak, Ajay Dhar**  
2017, *Materials Research Express* 4 (7), 075507.
- 7) *Facile synthesis of higher manganese silicide employing spark plasma assisted reaction sintering with enhanced thermoelectric performance*  
**Saravanan Muthiah, R.C.Singh, B.D.Pathak, Ajay Dhar**  
2016, *Scripta Materialia*, 119, pp.60-64.
- 8) *Enhancement of thermoelectric figure of merit in Bi<sub>2</sub>Se<sub>3</sub> crystals through a necking process*  
**Shashikant Gupta, N Vijayan, Anuj Krishna, Kanika Thukral, K K Maurya, Saravanan Muthiah, Ajay Dhar, B Singh, G Bhagavannarayana**  
2015, *Journal of Applied Crystallography*, 48, pp.533-541.

- 9) *Double-Doping Approach to Enhancing the Thermoelectric Figure-of-Merit of n-Type Mg<sub>2</sub>Si Synthesized by Use of Spark Plasma Sintering*  
**Saravanan Muthiah, B. Sivaiah, B. Gahtori, K. Tyagi, A.K. Srivastava, B.D.Pathak, A. Dhar, and R. C. Budhani.**  
2014, *Journal of Electronic Materials*, 43, pp.2035-2039.
- 10) *Ultrafine grain structure features in spray-formed AZ31 magnesium alloy*  
**M. Saravanan, B. Sivaiah, A.K. Srivastava, Ajay Dhar**  
2014, *Materials & Design*, 60, pp. 21-25.
- 11) *Conducting grain boundaries enhancing thermoelectric performance in doped Mg<sub>2</sub>Si*  
**Saravanan Muthiah, J. J. Pulikkotil, A.K. Srivastava, Ashok Kumar, B.D.Pathak, A. Dhar, and R. C. Budhani.**  
2013 *Applied Physics Letters*, 103, 053901.
- 12) *Doping and temperature dependence of thermoelectric properties in Mg<sub>2</sub>(Si,Sn)*  
**J. J. Pulikkotil, D. J. Singh, S. Auluck, M. Saravanan, D. K. Misra, A. Dhar, and R. C. Budhani.**  
2012 *Physical Review B* 86, 155204.
- 13) *Equal channel angular pressing of Al-5 wt% TiB<sub>2</sub> in situ composite*  
**K.R. Ravi, M. Saravanan, R.M. Pillai, A. Mandal, B.S. Murty, M. Chakraborty, B.C. Pai**  
2008 *Journal of Alloys and Compounds* 459 (1-2), pp. 239-243.
- 14) *Development of ultrafine grain aluminium-graphite metal matrix composite by equal channel angular pressing*  
**M. Saravanan, R.M. Pillai, K.R. Ravi, B.C. Pai, M. Brahmakumar**  
2007 *Composites Science and Technology* 67 (6), pp. 1275-1279.
- 15) *Equal channel angular pressing of pure aluminium - An analysis*  
**M. Saravanan, R.M. Pillai, B.C..Pai, M. Brahmakumar, K.R. Ravi**  
2006 *Bulletin of Materials Science* 29 (7), pp. 679-684.

## **Patents**

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## **Current Activities**

*(Not more than 100 words)*

The development of thermoelectric materials/devices for clean energy generation and waste heat recovery applications. The research focuses on the fundamental and scientific understanding of thermoelectric performance and its applications. Standardization employing Materials Metrology. Mechanical Testing of Materials and their standardization by best-known and widely accepted international standards.

### **Honour(s)/Award(s)/ Fellowship(s)**

- FIE - The Institution of Engineers (India)
- CHARTERED ENGINEER - The Institution of Engineers (India)

### **Contributions to AcSIR**

- Associate Professor (Honorary)
- Faculty PhD course – 2 Nos
- PhD students – 4 Nos (ongoing)

### **Membership of Professional Societies/ Institutions**

- Life Member- Metrology Society of India (MSI)
- Life Member- The Indian Institute of Metals (IIM)
- Life Member- Materials Research Society of India (MRSI)
- Life Member- Electron Microscope Society of India (EMSI)
- Life Member- The Institution of Engineers (IEI)

### **Any other Information**

*(Not more than 100 words)*

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