

## Resume

Name : Arumugam THAMIZHAVEL

Sex : Male

Age : 35 Years

Nationality : Indian

Marital Status : Married

Qualification : Ph.D  
Crystal Growth of High Tc Superconductors.

Post Doc Experience : 5 Years.

Awards : Monbusho Fellowship by Japanese Government  
JSPS Fellowship by Japanese Government.  
B.R.Lakshamanan Memorial Prize from Univ. of Madras

Present Address : Dr.A. Thamizhavel  
Prof.Onuki's Research Group  
Department of Physics,  
Graduate School of Science  
Osaka University,  
Toyonaka Campus,  
Osaka 560 0043, JAPAN.

Reference:  
Available upon request

## Experimental Skills:

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1. Sample growth and preparation techniques: Growth of single crystals by flux growth, sintering, **arc melting**, annealing, pressing, cutting, chemical etching, **glass and quartz blowing (to make ampoules)**. Emphasis on superconducting, magnetic and correlated electron systems, **rare-earth intermetallic compounds**, oxides etc., **Separation of the flux by means of centrifuging**.
2. **Design and making of special kind of molybdenum crucible** for the growth of single crystals like CePt<sub>3</sub>Si, CeNiGe<sub>3</sub> and CeRhGe
3. X-ray diffractometry operation: **Laue and Powder** diffraction (phase identification and lattice refinements). **Orientation and cutting of crystals** along the desired crystallographic directions. **Rietveld analysis using FULLPROF**.
4. **Experiments using cryogenic systems**, Low temperature resistivity, specific heat measurements, Scanning Hall Probe, de Haas-van Alphen experiment. **High Pressure resistivity** measurement using a piston cylinder high pressure cell.
5. Hands on experience with **Scanning Electron Microscope (SEM)** Leica Stereoscan S440 model. Optical microscope with hot-stage .
6. Operation of furnaces (box, vertical, tubular), **tetra arc melting**, annealing temperature controllers, vacuum systems etc.,
7. Advanced computer operation: experimental data processing and analysis (**IGOR pro, Microcal Origin, Mathematica**), image processing (**Corel, Adobe Illustrator, Photoshop, Macromedia FLASH etc.**), word processing (**LaTeX, MS-Office**), Basic HTML, **Computer programming using C**, operating systems installation and configuration (DOS, WINDOWS), hardware and peripherals installation and configuration. Preliminary knowledge with installation and working in **REDHAT Linux** .

## Languages Known:

1. Tamil
  2. Hindi (Sahitya Ratna from Allahabd Hindi Vishwa Vidyalaya)
  3. English
- Japanese (ability to communicate)

## Typing:

1. Tamil
  2. English
  3. Hindi
  4. Japanese
- (By Microsoft IME)

## Research Publications:

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1. High pressure effect on the electronic state in CeNiGe<sub>3</sub>: Pressure induced-superconductivity. M. Nakashima, K. Tabata, A. Thamizhavel, T.C. Kobayashi, M.Hedo, Y. Uwatoko, K. Shimizu, R. Settai, Y. Onuki **J.Phys.: Condens. Matter.** **16 (2004) L255-L262.**
2. Strong uniaxial crystal field and ising like exchange interaction of CeAgSb<sub>2</sub>, S. Araki, N. Metoki, **A.Thamizhavel**, and Y. Ōnuki, **J. Magn. Magn. Mater.** (In Press)
3. Thermal expansion and magnetostriction in CeRh<sub>3</sub>B<sub>2</sub>, T.Takeuchi, **A.Thamizhavel**, T.Okubo, M.Yamada, Y. Inada, A.Galatanu, E. Yamamoto and Y. Ōnuki, **J. Magn. Magn. Mater.** (In Press)
4. Low temperature magnetic properties of CeTBi<sub>2</sub> (T = Ni, Cu and Ag) single crystals. **A. Thamizhavel**, A. Galatanu, E. Yamamoto, T. Okubo, M. Yamada, K. Tabata, T.C. Kobayashi, N. Nakamura, K. Sugiyama, K. Kindo, T. Takeuchi, R. Settai, and Y. Ōnuki, **J. Phys. Soc. Jpn.** **Vol. 72 (2003) pp. 2632-2639.**
5. Anisotropic electrical and magnetic properties of CeTSb<sub>2</sub> (T: Cu, Au and Ni) single crystals, **A. Thamizhavel**, T. Takeuchi, T. Okubo, M. Yamada, R. Asai, S. Kirita, A. Galatanu, E. Yamamoto, T. Ebihara, Y. Inada, R. Settai, and Y. Ōnuki, **Phys. Rev. B** **68 (2003) 054427**
6. Anisotropic thermal and magnetic properties of CeAgSb<sub>2</sub> : Explanation via crystalline electric field scheme, T.Takeuchi, **A.Thamizhavel**, T.Okubo, M.Yamada, N.Nakamura, T.Yamamoto, K.Sugiyama, A.Galatanu, E. Yamamoto, K.Kindo and Y.Ōnuki **Phys. Rev. B, Vol. 67 (2003) 064403.**
7. Crystal Structure, Magnetic Ordering and Magnetic Excitation in 4f-Localized Ferromagnet CeAgSb<sub>2</sub>, S. Araki, N. Metoki, A. Galatanu, E. Yamamoto, **A. Thamizhavel** and Y. Ōnuki. **Phys. Rev. B, Vol.68 (2003) 024408.**
8. Unique Fermi surfaces with quasi one dimensional character in CeRh<sub>3</sub>B<sub>2</sub> and LaRh<sub>3</sub>B<sub>2</sub>, T. Okubo, M. Yamada, **A. Thamizhavel**, S. Kirita, Y. Inada, R. Settai, H. Harima, K. Takegara, A. Galatanu, E. Yamamoto and Y. Ōnuki, **J. Phys.: Condens. Matter** **15 (2003) L721-L727.**
9. Magnetic properties and a change of the electrical resistivity under pressure in CePtGe<sub>2</sub>. S. Kirita, **A. Thamizhavel**, T. Takeuchi, K. Tabata, T.C. Kobayashi, A. Galatanu, E. Yamamoto, R. Settai, S. Ramakrishnan and Y. Ōnuki, **J. Phys. Soc. Jpn.** **Vol. 72 (2003) pp. 2338-2343.**

10. An anomalously huge resistivity peak under pressure in CeRhGe. R. Asai, **A. Thamizhavel**, H. Shishido, T. Ueda, Y. Inada, R. Settai, T.C. Kobayashi, Y. Ōnuki, **J. Phys.: Condens. Matter.** **15** (2003) **L463-L468**.
11. Magnetic Compton scattering study of CeRh<sub>3</sub>B<sub>2</sub>, Y.Sakurai, M.Itou, J.Tamura, S.Nanao, **A.Thamizhavel**, Y.Inada, A.Galatanu, E.Yamamoto, and Y.Onuki, **J. Phys.:Condens Matter** **15** (2003) **S2183-2186**.
12. de Haas-van Alphen effect and magnetoresistance in CeRh<sub>3</sub>B<sub>2</sub>, Yoshihiko Inada, Tomoyuki Ohkubo, Arumugam **Thamizhavel**, Mineko Yamada, Shingo Kirita and Yoshichika Ōnuki, **Physica B** **329-333** (2003) **595-596**.
13. On the unusual magnetic behaviour of CeRh<sub>3</sub>B<sub>2</sub>, A. Galatanu, E. Yamamoto, T.Okubo, M.Yamada, **A. Thamizhavel**, T. Takeuchi, K. Sugiyama, Y. Inada and Y. Ōnuki, **J. Phys.: Condensed Matter** **15** **S2187-S2191**.
14. Crystalline electric field excitation in CeAgSb<sub>2</sub>, S. Araki, N. Metoki, **A. Thamizhavel** and Y. Ōnuki, **J. Phys. Condens. Matter.** **15** (2003) **S2179-S2182**.
15. Electrical and magnetic properties of cerium-transition metal intermetallics CeTSb<sub>2</sub> (T: Cu, Au and Ni), **A. Thamizhavel**, T. Okubo, M. Yamada, A. Galatanu, E. Yamamoto, Y. Inada, T. Ebihara and Y. Ōnuki **Physica B Vol. 327** (2003) **374**.
16. Magnetism and high field magnetization of ErCu<sub>2</sub>, K. Sugiyama, T. Yamamoto, N. Nakamura, **A. Thamizhavel**, S. Yoshii, K. Kindo, N. H. Luong and Y. Ōnuki **Physica B Vol. 327** (2003) **423**.
17. de Haas-van Alphen experiments in the quantum critical region of cerium and uranium compounds. Y. Ōnuki, R. Settai, S. Araki, M. Nakashima, H. Ohkuni, H. Shishido, **A. Thamizhavel**, Y. Inada, Y.Haga, E.Yamamoto and T.C.Kobayashi, **Acta Physica Polonica B vol. 34** (2003) **667**.
18. Quasi-2D Fermi surfaces of the magnetic compound CeAgSb<sub>2</sub>. Y. Inada, **A. Thamizhavel**, Y. Sawai, S. Ikeda, H. Shishido, T. Okubo, M. Yamada, Y. Ōnuki and T. Ebihara, **Acta Physica Polonica B vol. 34** (2003) **1141**.
19. Huge residual resistivity in the quantum critical region of CeAgSb<sub>2</sub>, M. Nakashima, S.Kirita, R.Asai, T.C.Kobayashi, T.Okubo, M.Yamada, **A.Thamizhavel**, Y.Inada, R.Settai, A.Galatanu, E.Yamamoto, T.Ebihara and Y. Ōnuki, **J. Phys. Condens. Matter vol. 15** (2003) **L 111**
20. An unusual hollow cylindrical Fermi surface of a quasi-two-dimensional compound CeAgSb<sub>2</sub>. Y. Inada, **A.Thamizhavel**, H.Yamagami, T.Takeuchi, Y.Sawai, S.Ikeda, H.Shishido, T.Okubo, M.Yamada, K.Sugiyama, N.Nakamura,

- T.Yamamoto, K.Kindo, T.Ebihara, A.Galatanu, E.Yamamoto, R.Settai and Y. Ōnuki, **Phil. Mag. B Vol.82 (2002) 1857.**
21. Pressure study of an antiferromagnet,  $\text{CeMg}_2\text{Cu}_9$ , H. Nakawaki, Y.Inada, R.Asai, M.Yamada, T.Okubo, S.Ikeda, **A.Thamizhavel**, T.C.Kobayashi, R.Settai, E.Yamamoto and Y. Ōnuki, **J. Phys. Condens. Matter vol. 14 (2002) L305 – L311.**
  22. Weak link path model and E-J characteristics in Ag/Bi2223 tapes, K.Ogawa, **A.Thamizhavel**, A.Sakai and K.Osamura, **Applied superconductivity 1 (1999), 575-578.**
  23. Remanent magnetic field distribution in Bi-2223/Ag superconducting tape, **A.Thamizhavel**, M Sugano, N. Fukuda, A.Sakai and K. Osamura, **Advances in Superconductivity XII Proceedings of the International symposium on superconductivity (ISS '99), 673-675.**
  24. Determination of nucleation parameters of YBCO from high temperature solution, D.P.Paul, **A. Thamizhavel** and C. Subramanian, **Crystal Research and Technology 34 (1998) 503-508.**
  25. Growth and texturing studies of  $\text{Bi}_{2.1}\text{Y}_{0.1}\text{Sr}_{0.9}\text{CaCu}_{2-x}\text{Li}_x\text{O}_8$  crystals grown by floating zone technique, D. Prabhakaran, **A. Thamizhavel**, R.Jayavel and C. Subramanian, **Journal of Crystal Growth 183 (1998) 573-580.**
  26. Morphology and characterization studies of Y doped Bi-2212 single crystals, D.Prabhakaran, **A. Thamizhavel** and C.Subramanian, **Physica C 288 (1997) 249-254.**
  27. Studies on simultaneous substitution of Pb and Y in  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$  single crystals. **A. Thamizhavel**, D. Prabhakaran, R. Jayavel and C. Subramanian, **Physica C 288 (1997) 163-166.**
  28. Growth and characterization of superconducting  $\text{Bi}_2\text{Sr}_2\text{Ca}_{(1-x)}\text{Ce}_x\text{Cu}_2\text{O}_{8+\delta}$  single crystals. **A. Thamizhavel**, D. Prabhakaran, R. Jayavel and C. Subramanian, **Physica C 275 (1997) 279-283.**
  29. Effect of degradation on surface and mechanical properties of  $\text{C}_{60}$  and  $\text{C}_{60}/\text{C}_{70}$  single crystals. C. Sekar, **A. Thamizhavel** and C. Subramanian, **Physica C 275 (1997) 193-197.**
  30. Growth and characterization of  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_x$  whiskers, **A. Thamizhavel**, R.Jayavel, P.Murugakoothan and C. Subramanian **Proceedings – Electrochemical Society (1995), 95-9 (Low Temperature Electronics and High Temperature Superconductivity), 100-4.**

31. Growth of pure and Pb doped Bi-2212 whiskers, **A. Thamizhavel**, R. Jayavel, D. Arivuoli, C. Subramanian and P. Ramasamy, **Appl. Supercond. [Pap. Eur. Conf.] 1<sup>st</sup> (1993), 2 , 1577-80.**
32. Growth of large size twin free  $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$  single crystals by a temperature gradient technique, R. Jayavel, **A. Thamizhavel**, P. Murugakoothan, C.R. Venkateswara Rao, C. Subramanian and P. Ramasamy, **Journal of Crystal Growth 137 (1994) 273-277.**
33. Growth, twin and domain structure studies of superconducting bismuth strontium calcium yttrium copper oxide ( $\text{Bi}_2\text{Sr}_2\text{Ca}_{1-x}\text{Y}_x\text{Cu}_2\text{O}_{8+\delta}$ ) single crystals. R. Jayavel, **A. Thamizhavel**, P. Murugakoothan, C. Subramanian and P. Ramasamy, **Physica C, 215 (1993) 429-434.**