

CURRICULUM VITAE

Guna Seelan Selvaduray

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%LRPHGLFDO (QJLQHHULQJ &RRUGLQDWRU DQG 3URIHVVR
&KHPLFDO DQG 0DWHULDOV (QJLQHHULQJ 'HSDUWPHQW
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Guna Seelan Selvaduray ± ' H W D L O H G 3 U R I H V V L R Q D O + L V W R U \

Department of Chemical and Materials Engineering 6 D Q - R V H 6 W D W H 8 Q L Y H U V L
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Current research interests

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(QJLQHHULQJ 3URJUDP :DVUHVSQRVLEOH IRU DOO DVSH
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Service to University Community

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*UDGXDWH 6WXGLHV DQG 5HVHDFK &RPPLWWHH 'HDQ 6H
DQG 3URPRWRQ 573 &RPPLWWHH &KDLUH FRPPLWWHH
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8QLYHUVLW\ &RPPLWWHH 5HVHDFK &RPPLWWHH \$VVRFLDWH
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WKDW FDQ EH FDXVHG E\ QDWXUDO DQG RWKHU GLVDVWH
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7UDQVODWLRQV SURRWHQV 2RQ SUBVHFWWLQYROYHG WU
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6HLVPLF 6DIHW\ ~~Homeowner's Guide to Earthquake Safety~~ R PDNH LW PRUH
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Research and Professional Activities

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Chapter of International Microelectronics and Packaging Society

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boards 3 HDN 6 Materials selection for chlorine containing systems 6 < 17 (;

8 6 \$ Earthquake hazard reduction \$ V V R F L D W L R Q R I % D \ \$ U H D * R Y

Special problems posed by hazardous materials during earthquakes X D Q W X P * U R X S

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Effect of deposition conditions on surface morphology of thin films 4 W U R Q Fracture

mechanisms of ceramic capacitors : H V W H U Q ' L J L W C o r r o s i o n & R e l i a b i l i t y o f

disk media, and Development of advanced magnetic disk substrates 7 , (Q J L Q H H U L Q J

7 R N Earthquake hazard reduction 8 U E D I Q W \ 5 H V H D U F K , Q V W L W X W H 7

Cost/benefit analysis of risk reduction techniques \$ O J D & R U S R F a i l u r e a n a l y s i s o f

hazard mitigation & K L S 3 S e a p a c s u l a t i o n a n d i n t e r c o n n e c t i o n o f

Microelectronic Devices 7 K H 3 L Q V C o r r o s i o n i n d e v e l o p m e n t i n e l e c t r o n i c

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Components and Devices) 6 H D J D W H (S t r e n g t h C a r a c t e r i z a t i o n o f G l a s s

Substrates) \$ G D E a i l u r e a n a l y s i s o f e l e c t r o n i c c o m p o n e n t s a n d d e v i c e s \$ O J D

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(Corrosion Prevention of Ice-making Systems)

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9LWULILHG QXFOHDU ZDVWHV FDQLVWHU PDWHULDO KP
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\$QDO\VLV RI WKH EDFN HQG RI WKH QXFOHDU IXHO F
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PDLQWHQDQFH VFKHGXOHV DQG SURFHGXUHV 6XSHUYLVH
WR 0D\

Guna Selvaduray – Publications/Papers

1. Aihara, H., **G. S. Selvaduray**, A. Y. Craig, and J. Moskito, "Surface Characteristics and Biocompatibility Study of Electropolished Wrought Co-Cr Alloy L605 for Biomedical Application", Proceedings of 2008 International Medical Devices Conference, Oct 1-3, 2008, Minneapolis, Minnesota
2. Leung, D. and **G. Selvaduray**, "Effect of Design Factors on Microvia Reliability of Flip Chip Ball Grid Array Polymeric Substrates," Journal of Microelectronics and Electronic Packaging, No. 5, p 104-115. (2008)
3. Aihara, H. and **G. S. Selvaduray**, "Surface Characterization and Biocompatibility of Co-Cr Alloy L605 Electropolished in 15 vol % Phosphoric Acid", Proceedings of 2008 Translational Biomaterial Research Symposium, Society for Biomaterials, September 11-13, 2008, Atlanta, Georgia
4. Drexel, M., **G.S. Selvaduray**, and A. Pelton, "The Effects of Cold Work and Heat Treatment on the Properties of Nitinol Wire", Proceedings of Materials and Processes for Medical Devices Conference, Palm Desert, California (September 23-25, 2007)
5. Chun B., H, Aihara, A.M.-C. Kuo, K.Jaladi, **G. S. Selvaduray**, and A.Y. Craig, "Effect of Microblasting on Surface Characteristics and Cytotoxicity of NiTi", Proceedings of Materials and Processes for Medical Devices Conference, Palm Desert, California (September 23-25, 2007)
6. Cruz, M. M., R. T. Winslow, and **G.Selvaduray**, "Effect of BGA Reballing on the Formation of Intermetallic Compounds," Symposium for RoHS Impact on Rework/Repair/ Reprocessing, Maryland, USA (September 11, 2007).
7. Cruz, M. M., and **G. Selvaduray**, "Interfacial Reactions between Sn-3.0Ag-0.5Cu Solder and Printed Circuit Board Coatings," in Proc. IPC International Conference on Lead-free Materials Surface Finishes, San Jose, California, USA (8-9 May 2007).
8. Cruz, M. M., R. T. Winslow, and **G. Selvaduray**, "Minimizing Thermal Gradients during Hot Solder Dip," in Proc. Components for Military & Space Electronics Conference, Los Angeles, California, USA (12-15 March 2007), pp. 335-352.
9. Drexel, MTd [(9)-1 (,)Tj ET 227.52 348.pe3 TMC /LBod2(i)-9(ni)-9(mi)-9(A)14(g)](BM2673n16lg)](2()Tj -0.2 1 T

13. **Selvadurai, G.** and S. Trigwell, “

27. **Selvaduray, G.**, "*Utilization of Pb-free solders in MEMS Packaging*", in SPIE Proceedings on Reliability, Testing, and Characterization of MEMS/MOEMS, R. Ramesham and D. Tanner, Eds., 2003, Vol 4980, , pp. 268 – 274. (Invited)
28. Trigwell, S. and **G. Selvaduray**, "

60. Trigwell, S., **G. Selvaduray** and A. Singh, "*Effects of Intermetallic Compound Formation on the Electrical Performance of Wirebonded Interconnects*", Intl. J. of Microcircuits and Electronic Packaging, Vol. 19, No. 1, First Quarter 1996. pp 14-21.
61. Barez, F., **G. Selvaduray** and R. Agarwal, "*Electronic and Microelectronic Packaging Curriculum Development at San Jose State University*", Proc. INTERPACK '95, American Society of Mechanical Engineers, Honolulu, Hawaii, March 1995.
62. **Selvaduray, G.**, "*Environmental Integration and Technologies*", Advanced Manufacturing: Technology and International Competitiveness, UCRL-ID-120595, Feb 1995.
63. **Selvaduray, G.**, "*Undergraduate Engineering Ceramics Laboratory Development*", International Journal of Engineering Education, Vol. 11, No. 4-5, (1995) pp 374-379.
64. Eslamy, M. and **G. Selvaduray**, "*Polymers in Microelectronics Packaging: Challenges and Trends*", Proceedings International Seminar of Polymer Science and Technology, Shiraz, Iran, May 2-4, 1994.
65. **Selvaduray, G.** and A. Singh, "*Modeling of Flip-Chip-Bonded and Wire-Bonded MCM Interconnects for Electrical Performance Comparison*", Intl. J. of Microcircuits and Electronic Packaging, Vol. 17, No. 1, First Quarter 1994. pp 14-21.
66. Abtew, M. and **G. Selvaduray**, "*Solder Wicking in Surface Mount Vapor Phase Reflow Processes*", Proc. 8th International Electronic Materials & Processes Conference, ASM International, San Jose, California, August 1993. pp 151-156.
67. Aggarwal, I. and **G. Selvaduray**, "*Role of CuxSny Intermetallics in the Reliability of Controlled Collapsed Chip Connection (C4)*", Proc. 8th International Electronic Materials & Processes Conference, ASM International, San Jose, California, August 1993. pp 75-82.
68. **Selvaduray, G.** and L. Sheet, "*Aluminum Nitride: A Review of Synthesis Methods*", Materials Science and Technology, June 1993, Vol. 9, pp 463-464 and Materials Science and Technology, June 1993, Vol. 9, pp 463-464.

76. **Selvaduray, G.** and C. Lomax, "*Fusible Heat Sink Materials: An Identification of Alternatives*", Proc. 21st International Conference on Environmental Systems, SAE International, San Francisco, California. July 15-18, 1991.
77. Balachandran, U., D. H. Xu, **G. Selvaduray**, et al, "*Characterization of YBCO Superconductors Sintered in CO₂-Containing Atmospheres*", Ceramic Transactions, Vol. 18, 1991. pp 341-355.
78. **Selvaduray, G.**, D. Richard, D. Quinn, and D. Rowland, "*Relationship Between Microstructure and Physical Properties of Al₂O₃ and SiC Reinforced Aluminum Alloys*", Interfaces in Metal Ceramics Composites, R.Y. Lin, et al, Eds., TMS, (1990) pp 271 - 289.
79. **Selvaduray, G.** and L. Martinez, "*Thin Alumina Coatings on Borosilicate Glass: Interfacial Interactions During Heat Treatment*", Interfaces in Metal Ceramics Composites, R.Y. Lin, et al, Eds., TMS, (1990) pp 137 - 150.
80. Balachandran, U., D. H. Xu, **G. Selvaduray** et al, "*Degradation of Properties of YBa₂Cu₃O_x Superconductors Sintered in CO₂-Containing Atmosphere*",

93. **Selvaduray, G.**, "Earthquake Emergency Preparedness in Japan", People and National Land Policy, Vol. 10, No. 3, pp. 24-29. (Sept 1984) (Japanese).
94. **Selvaduray, G.**, "Pyrometallurgical Reprocessing of Carbide Breeder Fuels", Proc. Int. Meeting on Fuel Reprocessing and Waste Management, American Nuclear Society, Wyoming. (Aug 1984).
95. **Selvaduray, G.**, "Decontamination Requirements for FBR- and LWR- Derived Pu", Trans. Am. Nuclear Soc. 1983 Winter Meeting, San Francisco. (Nov 1983).
96. **Selvaduray, G.**, "The Liquid Tin Process: An Experimental Investigation of a Potential Pyrometallurgical Process for Reprocessing Irradiated Carbide Fuels for Fast Breeder Reactors", European Appl. Res. Rept. - Nucl. Sci. Tech., Vol. 4, No. 6, pp. 1451-1514. (1983).
97. Ohto, T. and **G. Selvaduray**, "Effect of Backup Roll Length and Roll Neck Length on Profile for 4-h Mills", Iron and Steel Engineer, Vol. 58, No. 3, pp. 60-65. (Mar 1981).
98. **Selvaduray, G.**, "Interim Report on Dissolution of Uranium Carbide in Liquid Tin", Commission of the European Communities, Joint Research Center, Karlsruhe Establishment, Technical Report K 0280042. (Dec 1980).
99. Anderson, R. N. and **G. Selvaduray**, "Thermodynamics of Ti-Sn Alloys", Proc. 4th Intl. Titanium Conf., Kyoto, Japan. (May 1980).
100. **Selvaduray, G.**, M. Goldstein and R. N. Anderson, "Review of Reprocessing Technologies", Conservation and Recycling, Vol. 3, pp. 93-134. (Dec 1979).
101. **Selvaduray, G.** and M. Goldstein, "Internationally Safeguarded Atomic Fuel Exchange Center for the Asia Pacific Basin", Proc. 2nd Miami Intl. Conf. on Alternate Energy Sources, Miami, Florida. (Dec. 1979).
102. Anderson, R. N., **G. Selvaduray** and M. Goldstein, "

110. Goldstein, M., **G. Selvaduray** and R. N. Anderson, "*Methodology for the Evaluation of Alternate Technologies Applied to Nuclear Fuel Reprocessing*"

14. *"Effect of Surface Modifications on Biocompatibility of Implantable Medical Devices", ASM International, Santa Clara Valley Chapter Symposium, San Jose, California (September 17, 2005) (Invited)*
15. *"Dirty Bombs and Nuclear Devices", Certified Emergency Manager Lecture Series, San Jose, California (September 15, 2005) (Invited)*
16. *"Pb-Free Solders and their Effectiveness", International Microelectronics and Packaging Society, Northern California Chapter Meeting, Sunnyvale, California. (April 6, 2005) (Invited Luncheon Speaker)*
17. *"Nonstructural Earthquake Hazard Mitigation", Certified Emergency Manager Lecture Series II, City of San Jose, San Jose, California. (February 24, 2005) (Invited)*
18. *"Nonstructural Hazard Mitigation", Symposium on Best Practices in Risk Reduction for Colleges and Universities, University of Washington, Seattle. (January 27-28, 2005)*
19. *"Pb-Free Solders in Microelectronic Assembly", GEM Electronics (Shanghai) Co., Ltd., Shanghai, China. (July 28, 2004) (Invited)*
20. *"Sn-Whiskers: Driving Force and Growth Mechanisms", GEM Electronics (Shanghai) Co., Ltd., Shanghai, China. (July 29, 2004) (Invited)*
21. *"Developing Collaborative Approaches for Disaster Mitigation", Shizuoka NPO International Forum, Hamamatsu, Japan. (June 19-20, 2004) (Invited)*
22. *"Mitigating Disasters", US-Japan Disaster Reduction Forum, Crisis and Environment Management Policy Institute, Tokyo, Japan. (June 17, 2004) (Invited)*
23. *"The Collaborative for Disaster Mitigation at San Jose State University", Forum on Emergency Management, Ministry of Land, Infrastructure and Transport (MLIT), Sapporo, Japan. (June 16, 2004) (Invited)*
24. *"Mitigating Natural Hazards", Disaster Resistant California 2004 Conference, Sacramento, California. (May 3, 2004) (Invited Keynote Address).*
25. *"Biomedical Devices and Biomedical Implants", Symposium on Leading Technologies, College of Engineering, San Jose State University, February 26, 2004. (Invited)*
26. *"Natural Disaster Reduction", Forum on Sustainable Development, Asian Civil Engineering Coordinating Council, Taipei, Taiwan, December 4, 2003. (Invited)*
27. *"Protecting Laboratory Equipment by Implementing Nonstructural Hazard Mitigation," Seismic Design, Retrofit and Performance of Nonstructural Components in Critical Facilities, ATC-29-2, Applied Technology Council, Redwood City, California, October 23, 2003.*
28. *"The Critical Surface Tension of 316L Stainless Steel: Implications for Stent Thrombogenicity", ASM Materials and Processes for Medical Devices Conference, ASM International, Anaheim, California, September 8-10, 2003.*
29. *"Microdevice Packaging for Biomedical Applications", Symposium on Package Reliability Issues and Challenges, Microelectronic Packaging and Test Engineering Council, Sunnyvale, California. August 28, 2003. (Invited)*

30. *"Effect of Surface Treatment on Performance of Biomedical Implants"*, Edwards Lifesciences LLC, Irvine, California, August 12, 2003. (Invited)
31. *"Disaster Mitigation – An Overview"*, Western Athletic Conference Academic Alliance Symposium, San Jose, California, June 6, 2003.
32. *"Understanding and Minimizing Tin Whiskers – A Review of the Literature,"* Semiconductor Assembly Council, San Jose, California, June 4, 2003. (Together with Qian Sun.)
33. *"Development of Graduate Level Course on Packaging of Photonic and Optoelectronic Devices,"* 53rd Electronic Components and Technology Conference, IEEE-CPMT, New Orleans, May 26, 2003.
34. *"Effect of the Kobe Earthquake on Manufacturing Industries"*, Business Continuity Workshop, Semiconductor Equipment and Materials Institute, San Jose, California, March 19, 2003. (Invited).
35. *"Utilization of Pb-free solders in MEMS Packaging"*, Symposium on Reliability, Testing, and Characterization of MEMS/MOEMS, SPIE, January 29, 2003. (Invited)
36. *"The Kobe Earthquake and its Effects on Manufacturing Industries,"* Business Continuity Planning Conference – III, Applied Materials, Inc., Santa Clara, California, November 20, 2002. (Invited)
37. *"The Collaborative Approach to Disaster Mitigation,"* San Jose North Rotary Club, San Jose, California, October 18, 2002. (Invited)
38. *"Utilization of Pb-Free Solders in Microelectronics,"* Metallurgical and Materials Engineering Department, University of Nevada, Reno, Nevada, September 27, 2002. (Invited)
39. *"Translations and Communications,"* California Seismic Safety Commission, Sacramento, California, September 12, 2002. (Invited)
40. *"Nonstructural Hazard Mitigation Retrofit of an Engineering Laboratory at San Jose State University,"* Seventh National Conference on Earthquake Engineering, Boston, Massachusetts, July 2002.
41. *"Optoelectronics Packaging Education at San Jose State University,"* 2nd Annual IEEE Photonic Devices and Systems Packaging Symposium, Stanford, California, July 2002.
42. *"Workshop on Nonstructural Hazard Mitigation,"* Fires, Floods and Faults Conference - III, CDM, San Jose, California, April 29, 2002. (Invited)
43. *"Optoelectronic Packaging Educakagip 13JTJ /TT1 1 Tf -0.002 Tc 0.0016&.542 -1.952 Td (40.)Tj 0 Tc 0 Tw 1.398*

67. "Earthquake Emergency Preparedness in California," The University of Shizuoka, Shizuoka, Japan, May 8, 1998. (Invited)

68. "Earthquake Emergency Preparedness in California," The University of Shizuoka, Shizuoka, Japan, May 8, 1998. (Invited)

104. *"Nonstructural Hazard Mitigation"*, 1994 Hospital Disaster Management Conference, Hospital Council of Southern California, Los Angeles, March 23, 1994. (Invited)
105. *"Earthquake Caused Chemical Incidents"*, Second US-Japan Conference on Corporate Earthquake Programs, Tokyo, Japan, November 8-10, 1993.
106. *"Modeling of Fusion Enthalpy of Aqueous Solutions"*, Fifth Annual Research Review, Colleges of Engineering & Science, San Jose State University, San Jose, California, October 27, 1993.
107. *"Evaluation of Thermal Shock Test Methods for Ceramic Packages"*, 8th Electronic Materials & Processes Conference, ASM International, San Jose, California, August 1993.
108. *"Solder Wicking in Surface Mount Vapor Phase Reflow Processes"*, 8th Electronic Materials & Processes Conference, ASM International, San Jose, California, August 1993.
109. *"Role of CuxSny Intermetallics in the Reliability of Controlled Collapsed Chip Connection (C4)"*, 8th Electronic Materials & Processes Conference, ASM International, San Jose, California, August 1993.
110. *"Nonstructural Hazard Mitigation for Schools"*, School Sites: Becoming Prepared for Earthquakes, Sponsored by City of San Jose, October 6, 1992. (Invited)
111. *"Fusible Heat Sink Materials: Evaluation of Alternate Candidates"*, 22nd International Conference on Environmental Systems, Seattle, Washington, July 13-16, 1992.
112. *"Intermetallic Compound Formation in Flip Chip Bonding"*, Third Annual Symposium on Current Issues in Microelectronic Packaging, San Jose State University, San Jose, California, June 18-19, 1992. (Invited)
113. *"Corrosion Behavior of Condenser Tube Materials at the Geysers Power Plant: A Status Report"*, American Electroplaters & Surface Finishers Society, Santa Clara Valley Branch,

121. *"Hazardous Materials Incidents Related to the 1989 Loma Prieta Earthquake"*, Santa Clara County Emergency Managers Association, Monthly Meeting, September 19, 1991, Los Gatos, California. (Invited)
122. *"Materials Selection Parameters for Ceramic Substrates: Property Processing Relationships"*, 4th Electronic Materials & Processing Conference, Montreal, Canada, August 19-22, 1991.
123. *"Fusible Heat Sink Materials: An Identification of Alternate Candidates"*, 21st International Conference on Environmental Systems, San Francisco, California, July 15-18, 1991.
124. *"Ceramics of Low Flaw Content: Trimodal Powder Distribution in Sintering"*, Seminar presented at Raychem Corporation, Menlo Park, California, June 1991. (Invited)
125. *"Aluminum Nitride: An Engineering Commodity Study"*, Second Annual Symposium on Current Issues in Microelectronic Packaging, San Jose State University, May 18-19, 1991, San Jose, California. (Invited)
126. *"Seismic Safety from an International Perspective"*, Seismic Controls Symposium, Organized by The Santa Clara County Fire Chiefs Association, November 1, 1990, San Jose, California. (Invited)
127. *"Effect of CO2 on the Processing of Y-Ba-Cu-O Superconductors"*, Second Annual Review of Engineering Research, San Jose State University, October 25, 1990, San Jose, California.
128. *"Effect of Porosity on the Properties of Ceramic Substrates"*, Symposium on Current Materials Issues in Microelectronic Packaging, San Jose State University, San Jose, California, May 1990. (Invited)
129. *"Earthquake Hazard Reduction: Hazardous Materials and Glass Problems"*, First Annual Review of Engineering Research, San Jose State University, San Jose, California, October 1989.
130. *"Environmental Pollution: Is Recycling the Answer?"*, Invited presentation at the Tenth Caribbean Insurance Conference, Antigua, West Indies. September 1989. (Invited)

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Project Title	Awarding Agency	Performance Period	Amount
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&RPSXWHU 0RG 6ROGHU -RLQW IRU 60' 6WUXF	1DWLRQDO 6HP)DWLJXH/LFH &FRUSRUDWLRQ	LFRQGXFWRU -DQ ± HF	
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