

**23<sup>rd</sup>**  
**International Conference**  
**on**  
**Thermoelectrics**

25-29 July 2004  
Adelaide, Australia

Organised and hosted by the

**University of South Australia**  
**Adelaide, Australia**

on behalf of the

**International Thermoelectric Society**

Sponsored by

**Institute of Electrical and Electronic Engineers (IEEE)**

**CONFERENCE**  
**PROGRAMME**



**MONDAY, 26 July 2004**

08:00 Registration

09:00 Opening Addresses

09:30 Plenary Session 1

**Chairman:** Özdemir Göl  
**Venue:** Hall C

*Solid Solutions of Binary Skutterudites as a Means of Reducing Lattice Thermal Conductivity*, Ctirad Uher, Zhenhua Zhou, Thierry Caillat

*Progress Status of Skutterudite-Based Segmented Thermoelectric Technology Development*, T. Caillat, A. Kisor, L. Lara, A. Jewell, J. Sakamoto

10:30 Morning Break

**Venue:** Hall D

11:00 Oral Session 1

*Tellurides 1*

**Chairman:** Julian H Goldsmid  
**Venue:** Hall C

*Some Peculiar Features of Plastic Deformation and Diffusion Processes in Hot Extrusion of  $n$ - $\text{Bi}_2(\text{Te,Se})_3$  and  $p$ - $(\text{Bi,Sb})_2\text{Te}_3$* , O.B. Sokolov, S.Ya. Skipidarov, N.I. Duvankov

*$\text{Bi}_2\text{Te}_3$  Film Synthesized through a Co-reduction Method*, Hong Liu, Hongmei Cui, Feng Han, Xia Li, Jiyang Wang, R. I. Boughton

*Synthesis of Indium Doped  $\text{PbTe}$  By Powder Metallurgy*, Y. Gelbstein, Z. Dashevsky, M.P. Dariel

*Microstructure and Texture Development in Severely Deformed cast  $p$ -Type  $\text{Bi}_2\text{Te}_3$ - $\text{Sb}_2\text{Te}_3$* , Jae-Taek Im, K. T. Hartwig

*Effect of Interfacial Reaction on Thermoelectric Properties of  $\text{Bi/Te}$  Bilayer Thin Films*, C. N. Liao, S. W. Kuo

*Transport and Magnetic Properties of Mn-doped  $\text{Bi}_2\text{Te}_3$  and  $\text{Sb}_2\text{Te}_3$* , Hee-Woong Lee, Bong Seo Kim, Jeongyong Choi, Sunglae Cho

**MONDAY, 26 July 2004**

11:00 Oral Session 2  
*Generators 1*

**Chairman:** Takenobu Kajikawa  
**Venue:** Meeting Room 10

*Influence of Nonlinearity and Size Effects on the Efficiency of Microminiature Thermoelectric Generators*, L.P.Bulat, L.B.Romashkina, Y.S.Yang

*Thermoelectric Generation in Medium-temperature Waste Heat Recovery Applications*, J.J. Ghojel, J.G. Haidar

*Environmental Impact Assessment of Thermoelectric Generation in Automotive Waste Heat Recovery Application*, J.J. Ghojel

*Simulation of Thermoelectric Power Generation with Cylindrical Multi-Tubes*, Ryosuke O. Suzuki, Daisuke Tanaka, Shin-ichi Toda

*Development of the Thermoelectric Generating Modules Using Silicide and Bi-Te*, Hiromasa Kaibe, Lutz Rauscher, Ikuto Aoyama, Mika Mukoujima, Toshio Kanda, Shinichi Fujimoto, Toshitaka Kurosawa, Seijirou Sano

*Synergistic Design of the Thermoelectric Generator with Internal-axial-netted TC Modules*, Zhang Zheng, Hua Ben

12:30 Lunch  
**Venue:** Halls A & B

13:30 Plenary Session 2

**Chairman:** Michael D Rowe  
**Venue:** Hall C

*Bismuth Telluride: 50 Years and Beyond*, H. J. Goldsmid

*Formation of Nanometerscale Layers of V-VI ( $\text{Bi}_2\text{Te}_3$  -related) Compounds Based on Amorphous Prestages*, H. Böttner, A. Gavrikov, A. Mahlke, H. Kölbl, J.Nurnus

*Overview and New Directions in Bulk Materials Research for Thermoelectric Power Generation*, G. Nolas

**MONDAY, 26 July 2004**

15:30 Oral Session 3  
*Mainly Skutterides*

**Chairman:** George Nolas  
**Venue:** Hall C

*A New Synthesis Route to Antimonides and Their Properties*, K F Cai, Q Lei, L C Zhang

*Thermoelectric Properties of Porous  $Dy_xFe_yCo_4Sb_{12}$* , Gui-Ying Xu, Xiao-Feng Wu, Chang-Chun Ge  
*Magnetic and Thermoelectric Properties of Alkaline-earth Filled Skutterudites  $AT_4Sb_{12}$*  –

( $A = Sr, Ba$  and  $T = Fe, Ru$ ), E. Matsuoka, A. Ikeda, K. Hayashi, K. Tanaka, T. Takabatake

*Effect of Coating on the Performance of a Skutterudites-Based Segmented Thermoelectric Unicouple*,  
Hamed H. Saber, Mohamed S. El-Genk

*Performance Tests of Coated and Uncoated Segmented Skutterudites / BiTe Thermoelectric Unicouples*,  
Mohamed S. El-Genk, Hamed H. Saber, Jeff Sakamoto, Thierry Caillat

*Electrical Transport Properties of NbCoSn-based Half-Heusler Alloys*, Yasuhiro Ono, Shingo Inayama,  
Hideaki Adachi, Satoshi Yotsuhashi, Tsuyoshi Kajitani

15:30 Oral Session 4  
*Measurement*

**Chairman:** Ctirad Uher  
**Venue:** Meeting Room 10

*Anomalous Electronic Thermal Conductivity in Bi-Sb: A Possible Explanation*, H. J. Goldsmid,  
J. W. Sharp

*Development of a Precise Evaluation Technique for Thermoelectric Modules*, H. Takazawa, Y. Okada,  
H. Obara, F. Karube, M. Ozaki, T. Kajikawa

*Reliability Testing of Thin-Film Superlattice Thermoelectric Devices*, R. Alley, J. Cancheevaram,  
K. Coonley, B. O'Quinn, J. Posthill, E. Siivola, R. Venkatasubramanian

*Milliwatt Modules and Generators: Design, Fabrication, and Life Testing*, N. Elsner, J. Bass, N. Hiller,  
S. Ghamaty

*The Enhancement of ZT for AlPdRe Icosahedral Quasicrystals in Other Element Substituted or Thin Film Samples*, K. Kimura, T. Nagata, K. Kirihara, K. Kawaguchi, N. Koshizaki

*Standardisation in Thermoelectric Transport Properties Measurements – An update on the Cardiff NEDO laboratories, DLR Cologne and University of Aarhus program*, S.G.K. Williams, D.M. Rowe, C. Stiewe, E. Mueller, D. Platzek, B. Iversen, M. Christensen

**MONDAY, 26 July 2004**

17:00 Poster Session 1

*Tellurides*  
*Skutterudites*  
*Clathrates*

**Chairman:** Cronin Vining

**Venue:** Hall D

*Mechanical Alloying of CoSb<sub>3</sub>*, Soon-Chul Ur, Moon-Kwan Choi, Joon-Chul Kwon, Il-Ho Kim, Young-Geun Lee

*Increase in Power Factor of the Melt Growth p-type CoSb<sub>3</sub> by Post Annealing and Metal Deposition*, S.Matsui, T.Iida, S.Furuyama, M.Noda, M.Ota, Y.Takanashi

*A Model for Calculating the Figure of Merit of PbTe based Materials over a Wide Temperature Range*, Y. Gelbstein, Z. Dashevsky, M.P. Dariel

*Thermoelectric Properties on Porous (Bi<sub>x</sub>Sb<sub>1-x</sub>)<sub>2</sub>Te<sub>3</sub>*, Gui-Ying Xu, Xiao-Feng Wu, Chang-Chun Ge, Si-Tong Niu

*2-Dimensional Mismatch Power Loss Analysis On Thermo-Electric Power Generator Systems*, Hiroshi Nagayoshi, Kenjiro Yamaguchi, Hung He, Takenobu Kajikawa

*Thermoelectric Properties of Rare-Metal-Doped CoSb<sub>3</sub>*, Jong-Bum Park, Il-Ho Kim, Jung-II Lee, Kyung-Wook Jang, Good-Sun Choi, Byoung-Gue Kim, Wonbaek Kim, Joon-Soo Kim

*Preparation and Thermoelectric Properties of CoSb<sub>3</sub>*, Il-Ho Kim, Jong-Bum Park, Moon-Kwan Choi, Soon-Chul Ur, Good-Sun Choi, Byoung-Gue Kim, Wonbaek Kim, Joon-Soo Kim

*Thermoelectric Properties of CoSb<sub>3</sub> Cast under High Pressure*, Jung-II Lee, Il-Ho Kim, Kea-Joon Yang, Kyung-Wook Jang, Good-Sun Choi, Byoung-Gue Kim, Wonbaek Kim, Joon-Soo Kim

*Thermoelectric Properties of Directionally Solidified CoSb<sub>3</sub>*, Kyung-Wook Jang, Il-Ho Kim, Jung-II Lee

*Synthesis and Structural Analysis for Zn-rich Region of Zn<sub>4-x</sub>Cd<sub>x</sub>Sb<sub>3</sub> Bulk Crystals*, Takeshi Souma, Michitaka Ohtaki

*Relation between Solidification Conditions and Chemical Compositions on Vacuum Casting of CoSb<sub>3</sub> Compounds*, Takeshi Souma, Michitaka Ohtaki

*Preparation and Rietveld Analysis for the Bulk Crystals of (Co, Fe, Ni)Sb<sub>3</sub> compounds*, Takeshi Souma, Michitaka Ohtaki

*Hot Neutrons for the Investigation of Structure and Magnetism in Eu<sub>1-y</sub>Fe<sub>4</sub>Sb<sub>12</sub>*, M. Rotter, M. Doerr, P. Rogl, A. Grytsiv, A. Lindbaum, B. Beuneu

**MONDAY, 26 July 2004**

17:00 Poster Session 1

*Tellurides*

*Skutterudites*

*Clathrates*

*(continued)*

*Thermoelectric Properties of Transition-Metal-Substituted Clathrate Compounds*, H. Anno, M. Hokazono, K. Matsubara

*Transport properties of  $\text{Ca}_x\text{Co}_{4-y}\text{Ni}_y\text{Sb}_{12}$  skutterudite compounds at low and high temperatures*, M. Puyet, B. Lenoir, A. Dauscher, M. Dehmas, C. Stiewe, E. Müller, J. Hejtmanek

**MONDAY, 26 July 2004**

17:00 Poster Session 2

*Measurement  
Applications  
Theory*

**Chairman:** Patrick Schmidt-Winkel

**Venue:** Hall D

*High Efficiency in Thermoelectric Materials by Device Size Control*, H. Iwasaki, M. Koyano, Y. Yamamura, H. Hori

*Fabrication of Equipment for Evaluating ZT by Harman Method*, H. Iwasaki, M. Koyano, H. Hori

*Feasibility Study of Thermoelectric Power Generation for Stand-Alone Outdoor Applications*, E. Meydbray, T. Nguyen, J. Christofferson, R. Singh, A. Shakouri

*Feasibility Study on Electricity Generation Using Commercial Thermoelectric Cooling Modules*, Junpeng Yu, Jianzhong Zhang, Zeshen Wang, Baoguo Ren

*Development of Transient Measurement to Investigate Bi-Te Thermoelectric Properties in the High Temperature Region*, Shinichi Fujimoto, Toshitaka Kurosawa, Hiromasa Kaibe, Seijirou Sano

*Thermoelectric Properties of Co-Sb Systems for Power Generation Module*, F. Kiya, T. Tosho, H. Emoto

*Development of Skeleton Type Thermoelectric Module for Power Generation*, R. Takaku, T. Hino, T. Shindo, Y. Itoh

*The Analysis of a Heating System Based on Thermoelectric Heat Pump*, Yu.N. Lobunets

*Miniature Power Generation Device and its Application to Gas Combustion System*, A. Yamamoto

*Feasibility Study on Electricity Generation Using Commercial Thermoelectric Cooling Modules*, Junpeng Yu, Jianzhong Zhang, Zeshen Wang, Baoguo Ren

*Fabrication and Evaluation of an Element for Thermoelectric Generating System*, T. Masuda, Y. Kikuchi, Y. Seki, S. Tannaka, S. Yoneda, Y. Ohno

*High Efficiency Solar Energy System: Thermoelectric-Generators Assisted*, Francisco J. Villasevil, Antonio M. López, Germán Noriega

*Power Generation with Fe<sub>2</sub>VAl modules using Sodium Heat Source*, Shin-ichi Toda, Ryosuke O. Suzuki, Kouki Kondo, Satoshi Nakai, Shinji Yoshikawa, Kiyoshi Tamayama

*Physical Principals of Thermoelectric Converter Based on Sorting of Charge Carriers in Energy by Phonon Drag in p-n Junction*, Yu.G.Gurevich, G.N.Logvinov, O.Yu.Titov

*Magneto-Seebeck Coefficient Measurement of Bismuth Micro-wire Array under a Magnetic Field*, Hiroyuki Morita, Yasuhiro Hasegawa, Yoshiaki Ishikawa

**TUESDAY, 27 July 2004**

09:00 Plenary Session 3

**Chairman:** George Nolas  
**Venue:** Hall C

*Quasi Two Dimensional Correlated Electron Systems as Potential Bulk TE Materials*, Terry M. Tritt, N. D. Lowhorn, Tang Xiaofeng

*Nonequilibrium Electron-Phonon Transport Near Sharp Potential Barriers*, Gang Chen

*Electron Channeling X-ray Microanalysis for Site Occupation of the Thirde Element in  $\beta$ -FeSi<sub>2</sub>*, T. Morimura, M. Hasaka

10:30 Morning Break

**Venue:** Hall D

11:00 Oral Session 5

*Nanostructures 1*

**Chairman:** Harold Böttner  
**Venue:** Hall C

*Thermoelectric Bi<sub>2</sub>Te<sub>3</sub> nanotubes and nanowires prepared by hydrothermal synthesis*, X.H. Ji, X.B. Zhao, Y.H. Zhang, B.H. Lu, H.L. Ni

*Cross-Plane Seebeck Coefficient Anomaly in a High Barrier Superlattice with Miniband Formation*, Daryoosh Vashaee, Yan Zhang, Gehong Zeng, Yi-Jen Chiu, Ali Shakouri

*High Performance Multi Barrier Thermionic Devices*, Daryoosh Vashaee, Ali Shakouri

*Electric and thermal Conductance of Porous Thermoelectric Materials with Hollow Quantum Structure*, Gui-Ying Xu

*Electrodeposition of Highly Dense, Ordered Bismuth Telluride Nanowire Arrays*, Wei Wang, Qinghua Huang, Zhirong Zhang



**TUESDAY, 27 July 2004**

11:00 Oral Session 6  
*Generators 2*

**Chairman:** Thierry Caillat  
**Venue:** Meeting Room 10

*Development of a Thermoelectric Power Generation System in Industrial Furnaces*, K.Fujita, T.Oota, C.Tokunaga

*Thermoelectric Power Generation with Rectangular-Fin Type Elements and Its Applicability in Micro Systems*, Yutaka Oda, Hideo Yoshida

*A New Model of Thermoelectric Micro-Power Generator with parallelly arranged p-legs and n-Legs Fabricated by Electrodeposition*, Wei Wang, Bin Xu, Falong Jia, Zhuo Wang

*Using of a Ring-radial Generating Thermoelectric Module for the Systems of Uninterrupted Emergency Power Supply*, A.S. Ivanov, S.A. Varlamov, Y.S. Gaydina

*Evaluation of the Reliability of Thermoelectric Generator Modules Considering Elastic and Plastic Deformation and Creep Effect of the Solder Layer*, Toshinobu Tanimura, Kunihito Yamasaki, Qiang Yu, Ren Cai Chu, Seijirou Sano

12:30 Lunch  
**Venue:** Halls A & B

13:30 Plenary Session 4

**Chairman:** Kunihito Koumoto  
**Venue:** Hall C

*Thermoelectric Materials & Technology for Future High Power Deep Space Science Missions*, J.-P. Fleurial, B. Nasmith, J. Mondt, T. Caillat, G.J. Snyder, G. Stapfer, C.-K. Huang, A. Kindler, K. Johnson

**TUESDAY, 27 July 2004**

14:00 Oral Session 7  
*Tellurides 2*

**Chairman:** Jamil Ghojel  
**Venue:** Hall C

*The Influence of Tin Content on the Structural and Physical Properties of  $Pb_{1-x}Sn_xTe$  Solid Solutions,*  
Z. Dashevsky, R. Kreizman, D. Mogilevski, A. Jarashneli, M.P. Dariel

*Influence of Alloy Scattering on the Electron Mobility in Extruded  $(Bi_{1-x}Sb_x)_2(Te_{1-y}Se_y)_3$  Thermoelectric Materials,* D. Vasilevskiy, P. Frechette, A. Sami, R.A. Masut, S. Turenne, J.-M. Simard

*Optimum Power Factor of Films in the Bi-Te System,* L.W. da Silva, M. Kaviani, C. Uher

*Thermoelectric Properties of  $Bi_2Te_3$  Thin Film Produced by High Density Plasma Deposition Process,*  
Hsu-Shen Chu

14:00 Oral Session 8  
*Generators 3*

**Chairman:** Hideo Iwasaki  
**Venue:** Meeting Room 10

*Heat Rejection Alternatives for Lamp-Top Thermoelectric Generator,*  
C. Lertsatitthanakorn, S. Rittidech

*Passivation-free Thermoelectric Power Generation Module Using Textured P/N Oxides,* R. Asahi,  
H. Itahara, H. Kaga, K. Okuda, T. Tani

*Micro-thermoelectric Power Generator Fabricated by Nanowire Array Thermoelectric Material,*  
Falong Jia, Wei Wang, Jing Zhu, Jianzhong Zhang

*Fabrication of Thermoelectric Oxide Devices,* R. Funahashi, S. Urata, K. Mizuno, T. Kouuchi,  
M. Mikami

15:00 Afternoon Break  
**Venue:** Hall D

**TUESDAY, 27 July 2004**

15:30 Oral Session 9  
*Other Materials 1*

**Chairman:** Zinavi Dashevsky  
**Venue:** Hall C

*Potential for Improvement in Thermoelectric Properties of Hexaborides*, M. Takeda, Y. Kurita

*High Temperature Thermoelectric Properties of RE-B-Si Higher Borides*, Takao Mori

*The Effects of Addition of the Other Elements on Thermoelectric Properties of  $\alpha$ - and  $\beta$ -Rhombohedral Boron*, H.K. Kim, K. Kimura

*Electronic Properties of Semiconducting Rhenium Silicide in Respect to its Thermoelectric Properties*, L. Ivanenko, A. Filonov, V. Shaposhnikov, A. Krivosheev, G. Behr, D. Souptel, J. Schumann, H. Vinzelberg, V. Borisenko

*Thermoelectric Properties of  $Ba_xC_{60}$  Compounds*, X. Shi\*, L. D. Chen, S. Q. Bai, X. Y. Zhao

*Preparation of Boron-carbide ( $B_{13}C_2$ ) Thin Films and Thermoelectric Devices by Intense Pulsed Ion Beam Evaporation*, S. Sasaki, K. Yokoyama, T. Miura, T. Suzuki, H. Suematsu, W. Jiang, K. Yatsui, M. Takeda

15:30 Oral Session 10  
*Peltier Devices 1*

**Chairman:** L E Bell  
**Venue:** Meeting Room 10

*High Performance Heat Exchanger for Thermoelectric Cooling with Large Heat Loads*, T. Chandratilleke, B. Banney, P. Clarke

*Thermoelectric CPU Cooling Using High Efficiency Liquid Flow Heat Exchangers*, M. Davis, P. Clarke, B. Manners

*The Peltier-Actuated Microvalve*, R.P. Welle, B.S. Hardy, M.J. O'Brien

*High Cooling Power Density Silicon Microrefrigerator*, Yan Zhang, Gehang Zeng, Ali Shakouri

*Design and Simulation of Thermoelectric Heating System by Electro-thermal Model and Graphic Diagram*, W. Chimchavee

*Solid State Micro Climate Cooling System for Personnel Working in Indian Desert*, S. Chatterjee, P. Thamburaj, K.G. Pandey, P.K. Banerjee, W. Selvamurthy

**TUESDAY, 27 July 2004**

17:00 Poster Session 3  
*Nanostructures  
Films*

**Chairman:** Hiroyuki Fujishiro  
**Venue:** Hall D

*TEM Cross-section and Planview Preparation of Bi<sub>2</sub>Te<sub>3</sub> Thin Films Epitaxially Grown on BaF<sub>2</sub> Substrates*, N.Peranio, O.Eibl, J. Nurnus

*Quantitative EDX Analysis of Bi<sub>2</sub>Te<sub>3</sub> in the TEM*, N.Peranio, O.Eibl

*Electrodeposition of Bismuth Telluride Nanowires in Porous Alumina Templates*, L. Trahey, E. Hajime, C. Becker, A. M. Stacy

*Substrate Temperature Dependence of Recrystallization Process of Si-Ge-Au Amorphous Thin Films Evaluated by using PAS*, Y. Okamoto, A. Miyata, Y. Inoue, T. Kawahara, J. Morimoto

*Thermoelectric Properties and Thermoelectric Devices of InN and InON Thin Films Prepared by Reactive Radio-frequency Sputtering*, R. Izaki, N. Kaiwa, S. Sugimura, S. Yamaguchi, A. Yamamoto

*Enhancement of Seebeck Coefficient of InN Thin Films by Liquid Nitrogen Cooling Sputtering*, N. Kaiwa, S. Sugimura, R. Izaki, S. Yamaguchi, A. Yamamoto

*Thermoelectric Properties of InSb Thin Film Grown by Metalorganic Vapor Phase Epitaxy*, Y. Nagawa, T. Ishiguro, J. Maeda, T. Furukawa, Nakaba Kaiwa, S. Yamaguchi, A. Yamamoto

*The Boundary Scattering Of Phonons And The Maximum Thermal Conductivity Of Bi-Sn Nanowires*, D.V. Gitsu, T.E. Huber, L. A. Konopko, A.A. Nikolaeva, Gh.I. Para

*Seebeck Coefficient Anomaly Due To The Electron Topological Transition In Bi-Sb Wires*, A.A. Nikolaeva, D.V. Gitsu, T.E. Huber, L. A. Konopko, P.Bodiul

*Characterization of Individual Bismuth Telluride Nanowires by Transmission Electron Microscopy*, C. Becker, L. Trahey, J. Keyani, and A. M. Stacy

**TUESDAY, 27 July 2004**

17:00 Poster Session 4

*Oxides*

**Chairman:** Soon-Chul Ur

**Venue:** Hall D

*Thermoelectric Properties of Y-doped Polycrystalline SrTiO<sub>3</sub>*, H. Obara, A. Yamamoto, C. H. Lee, K. Kobayashi, A. Matsumoto, R. Funahashi

*Thermoelectric Properties of Bi-based Rhodium Oxides*, S. Okada, I. Terasaki

*Preparation and Anisotropic Thermoelectric Properties of New Cobaltites A<sub>x</sub>CoO<sub>2</sub> (A=Sr and Ca) Thin Films*, Hideaki Adachi, Tsutomu Kanno, Satoshi Yotsuhashi

*Preparation and Thermoelectric Properties of Oxygen-deficient Misfit Layer Cobaltite [Ca<sub>2</sub>CoO<sub>3-δ</sub>]<sub>p</sub>CoO<sub>2</sub>*, Y. Miyazaki, Y. Suzuki, T. Kajitani

*Thermoelectric Properties and Electronic Structure of Strontium Ferrites*, Takahiro Miura, Manabu Terui, Daisuke Kamoya, Masatoshi Takeda

*Size Effect of A-site Cation on Thermoelectric Properties in n-type CaMnO<sub>3</sub> System*, H. Fujishiro, Y. Suzuki, Y. Fujine, M. Ikebe

*Influence of Co-site Substitution on Thermoelectric Properties in La<sub>1-x</sub>Sr<sub>x</sub>CoO<sub>3</sub>*, Y. Fujine, H. Fujishiro, M. Ikebe, J. Hejtmanek

*Thermoelectric and Magnetic Properties of Layered Cobaltites: Na<sub>x</sub>CoO<sub>2</sub> and Ca<sub>3</sub>Co<sub>4</sub>O<sub>9</sub>*, H. Nakatsugawa, K. Nagasawa, M. Namba, T. Kuboyama, A. Asai

*Temperature Dependent Resistivity and Thermoelectric Properties of PbPd<sub>1-x</sub>Cu<sub>x</sub>O<sub>2</sub>*, T.C. Ozawa, T. Taniguchi, Y. Nagata

*Thermoelectric Properties of Bi<sub>2</sub>Ca<sub>2</sub>Co<sub>2</sub>O<sub>y</sub> Polycrystalline Textured Materials*, E. Guilmeau, M. Mikami, D. Chateigner, R. Funahashi

*Study of New Thermoelectric Material, CuAlO<sub>2</sub> Using ab-initio Calculations*, Hiroki Funashima, Hisatomo Harima, Akira Yanase, Hiroshi Katayama-Yoshida

*Thermoelectric and Transport Properties of textured Ca-doped (ZnO)<sub>m</sub>In<sub>2</sub>O<sub>3</sub> Ceramics*, H. Kaga, R. Asahi, T. Tani

*Thermoelectric Properties of Na<sub>x</sub>Co<sub>2</sub>O<sub>4</sub>/Ag Composites*, Mikio Ito, Daisuke Furumoto, Shigeru Katsuyama, Shigeta Hara

*Enhancement of Electrical Conductivity in Layered Cobaltite Ceramics by Texture Improvement*, Hiroshi Itahara, Toshihiko Tani, Jun Sugiyama, Ryoji Asahi

**TUESDAY, 27 July 2004**

17:00 Poster Session 4

*Oxides*

*(continued)*

*Thermoelectric Properties of Oxide added CuAlO<sub>2</sub>*, T.Kurotori, Y.Yoshida, S.Sugihara

*Thermoelectric Properties of Ca<sub>1-x</sub>Y<sub>x</sub>Mn<sub>1-y</sub>R<sub>y</sub>O<sub>3-z</sub> (R=Ru, Nb) at High Temperature*, Toshihide Tsuji, Pham Xuan Thao, Yasuhisa Yamamura

*Theoretical Investigation of Substitution Effects on the Electronic Structure and Transport Properties of Layered Cobalt Oxides Na<sub>x</sub>CoO<sub>2</sub>*, Xing Gao, John S. Tse, Dennis D. Klug, T. Tritt

*Spin State Transition in Ca-doped Na<sub>0.7</sub>CoO<sub>2</sub>: Muon Spin Rotation and Relaxation in the Layered Cobaltites with the Nominal Covalence Below 3.25*, J. Sugiyama, J. H. Brewer, E. J. Ansaldo, J. A. Chakhalian, H. Nozaki, H. Hazama, R. Asahi, T. Tani, Y. Ono, T. Kajitani

**WEDNESDAY, 28 July 2004**

08:00 Conference Desk Open

09:00 Plenary Session 5

**Chairman:** John Stockholm

**Venue:** Hall C

*Reversible thermoelectric nanomaterials*, T. E. Humphrey, H. Linke

*A Challenge to Create Novel Oxide Thermoelectrics*, K. Koumoto

*Superlattice Thin-film Thermoelectric Material and Device Technologies*, Rama Venkatasubramanian, Edward Siivola, Brooks O'Quinn, Kip Coonley, Anil Reddy, Chris Caylor, Pratima Addepalli, Thomas Colpitts, John Posthill

10:30 Morning Break

**Venue:** Hall D

11:00 Oral Session 11

*Oxides 1*

**Chairman:** Antoine Maignan

**Venue:** Hall C

*Thermoelectric properties of CaPd<sub>3</sub>O<sub>4</sub>-based oxides*, I. Terasaki, S. Ichikawa

*Solid-Phase Epitaxial Film Growth of Thermoelectric Oxide Semiconductor, Na<sub>x</sub>CoO<sub>2</sub>*, Hiromichi Ohta, Kenji Nomura, SungWng Kim, Shingo Ohta, Kunihito Koumoto, Masahiro Hirano, Hideo Hosono

*High-Temperature Thermoelectric Performance of N-Type Degenerate Semiconducting Titanate; Heavily-Nb-doped SrTiO<sub>3</sub>*, S.Ohta, H. Ohta, K. Koumoto

*Texture-Properties-Microstructure Relationship in Highly Oriented Ca<sub>3</sub>Co<sub>4</sub>O<sub>9</sub> bulk Materials*, E. Guilmeau, M. Masashi, K. Chong, D. Chateigner, Y. Sugiura, K. Fujie, S. Horii, J. Shimoyama, K. Kishio, R. Funahashi

*Preparation and Thermoelectric Properties of High Oriented Na<sub>x</sub>Co<sub>2</sub>O<sub>4</sub>. Ceramics by Spark Plasma Sintering method*, Keishi Nishio, Kazuma Takahashi, Yusuke Inaba, Mariko Sakamoto, Tsutomu Iida, Kazuyasu Tokiwa, Yasuo Kogo, Atsuo Yasumori, Tsuneo Watanabe

*Relationship between the Structural Dimensionality and the Thermoelectric Properties in Cobalt Oxides*, D. Flahaut, S. Hébert, C. Martin, D. Pelloquin and A. Maignan

**WEDNESDAY, 28 July 2004**

11:00 Oral Session 12  
*Basic Principles*

**Chairman:** Terry Tritt  
**Venue:** Meeting Room 10

*Percolation Effects in Impurity Subsystem of Crystal and Controlling of Thermoelectric Properties of Solid Solutions*, E.I. Rogacheva, O.N. Nashchekina, S.G. Lyubchenko, T.V. Tavrina, N. Kalashnik, M.S. Dresselhaus

*Theoretical Studies on the Thermopower of Semi-conductors and Low Band Gap Polymers*, Xing Gao, Dennis D. Klug, John S. Tse, I. Levesque, C.T. Ratcliffe, T. Tritt

*Barrierless Thermoelectric Cooling and Heating on Contact of Two Conducting Mediums*, Yuri Gurevich, Georgiy Logvinov

*The Role of Recombination Processes in Seebeck Effect – Application of Gurevich Theory on Cd<sub>1-x</sub>Zn<sub>x</sub>Te*, S. Vacková, O. Majlingová, V. Gorodinskij, Yu. G. Gurevich, G. N. Logvinov, K. Zdansky, J. Oswald

12:30 Lunch  
**Venue:** Halls A & B

13:30 Plenary Session 6

**Chairman:** J W Sharp  
**Venue:** Hall C

*Advanced Thermoelectric Micro Coolers*, V.A. Semenyuk



**WEDNESDAY, 28 July 2004**

14:00 Oral Session 13  
*Nanostructures 2*  
*Films*

**Chairman:** Doug Crane  
**Venue:** Hall C

*Large Positive Thermopower of Single Bismuth Nanowires*, A. D. Grozav, E. Condrea, A. G. M. Jansen, I. Sheikin

*Structural Analysis of Bi<sub>2</sub>Te<sub>3</sub> Thin Films and Superlattices Epitaxially Grown on BaF<sub>2</sub> by Transmission Electron Microscopy*, N. Peranio, O. Eibl, J. Nurnus

*Thermoelectric Properties of Bi-based Thin Film Structures*, E.I. Rogacheva, S.G. Lyubchenko, A.A. Yakovleva, A.V. Meriuts, M.S. Dresselhaus, G. Dresselhaus

14:00 Oral Session 14  
*Generators 3*

**Chairman:** Alexander Ehrlich  
**Venue:** Meeting Room 10

*A Novel concept of a Brick Energy Converter, Applicable to Intelligent Building Construction*, Antonio M. López, Francisco J. Villasevil1, Juan Bautista Carda, Germán Noriega

*Thermoelectric Low-Energy Generator for High Dynamic Applications*, Antonio M. López, Francisco J. Villasevil, Germán Noriega

*High-Performance Thin-Film Superlattice Technologies for Thermoelectric Cryogenic Cooling Applications*, Edward Siivola, Kip Coonley, Brooks O'Quinn, Pratima Addepalli, Ryan Wiitala, Rama Venkatasubramanian

*A Hybrid Photovoltaic-Thermoelectric Roof Solar Collector*, S. Maneewan, J. Hirunlabh, J. Khedari

15:00 Afternoon Break  
**Venue:** Hall D

**WEDNESDAY, 28 July 2004**

15:30 Oral Session 15  
*Oxides 2*  
*Other Materials 2*

**Chairman:** Hubert Scherer  
**Venue:** Hall C

*Thermoelectric Properties of Textured Ca<sub>3</sub>Co<sub>4</sub>O<sub>9</sub> Prepared by Large Grain Sized Powder,* M. Mikami, K. Chong, E. Guilmeau, D. Chateigner, R. Funahashi

*Reduction of Thermal Conductivity by Enhanced Phonon Scattering in Oxide Materials with Nanovoid Structure,* Michitaka Ohtaki, Sayaka Maehara

*Thermoelectric Properties of BayCo<sub>4</sub>Sb<sub>12</sub>-Based Composites,* L. D. Chen, X. Shi, X. Y. Huang, S. Q. Bai

*Structural and Thermoelectric Properties of Undoped PbSe Epitaxial Films Alloyed with Tin,* J. Nurnus, H. Böttner, R. Glatthaar, J. König, A. Lambrecht

*Thermoelectric Power in Misfit Cobaltites: Optimisation by Chemical Substitutions,* A. Maignan, D. Pelloquin, S. Hébert, Y. Klein, M. Hervieu

*The Effect of Co-substitution on the Thermoelectric Properties of FeGa<sub>3</sub>,* Y. Amagai, A. Yamamoto, T. Iida, Y. Takanashi

15:30 Oral Session 16  
*Peltier Devices 2*

**Chairman:** V A Semenyuk  
**Venue:** Meeting Room 10

*High Power Density Thermoelectric Systems,* L. E. Bell

*Design of a 126 litre refrigerator/freezer commercial,* M. Davis, R. Weymouth, P. Clarke

*Modeling High-Power Density Thermoelectric Assemblies Which Use Thermal Isolation,* D.T. Crane

*A Miniaturized Thermoelectrically Driven Adsorption Chiller for Micro-Electronics Cooling and Air Conditioning Applications,* Chua Hui Tong, Anutosh Chakraborty, Wang Xiaolin, Sai Maung Aye

*Development of Small Footprint and Low-Current TE Modules for Optoelectronics Thermal Management,* Brooks O'Quinn, Ed Siivola, Kip Coonley, Rama Venkatasubramanian

**WEDNESDAY, 28 July 2004**

17:00 Poster Session 5

*Silicides*

Chairman: Richard Welle

Venue: Hall D

*First Principles Study of Effects of Ca and Sr Addition on Thermoelectric Properties of Mg<sub>2</sub>Si*,  
S. Yanagiya, H. Funashima, A. Yanase, H. Harima, H. Katayama-Yoshida

*First-principle Investigations on the Electronic Structure of Mg<sub>2</sub>B<sub>IV</sub> (B<sub>IV</sub> = Si, Sn, Ge) and Their Solid Solutions*, Lutz Rauscher, Hiromasa T. Kaibe, Seijirou Sano, Kyozauro Takeda

*Crucible Dependent Thermoelectric Properties of Bulk Mg<sub>2</sub>Si Crystals Growth by the Vertical Bridgman Method*, M.Yoshinaga, T.Iida, M.Noda, T.Endo, Y.Takanashi

*Thermoelectric Properties of Sintered Mg<sub>2</sub>Si<sub>(1-x)</sub>Sn<sub>x</sub>*, Y. Isoda, N. Shioda, H. Fuziu, Y. Imai, Y. Shinohara

*Temperature Gradient Solution Growth and Seebeck Coefficient of  $\beta$ -FeSi<sub>2</sub> Bulk Single Crystal*,  
M. Kuramitsu, M. Yoshio, M. Takeda, I. J. Ohsugi

*Effect of Crystallinity on Thermoelectric Properties in rf-sputtered beta-Fe<sub>1-x</sub>CoxSi<sub>y</sub> Films*, M. Sugita, Y. Oikawa, K. Kamata, C. Kim, H. Ozaki

*Improvement of thermoelectricity of FeSi<sub>2</sub> by addition of rare earth oxide*, S.Hiki, Y. Kondo, S.Sugihara

*Electron channeling X-ray microanalysis for site occupation of the third element in  $\beta$ -FeSi<sub>2</sub>*,  
T. Morimura, M. Hasaka

*Microstructure and Thermoelectric Property of Iron-silicide Doped with Co or Mn and Sb*, M. Hasaka, T. Morimura

**WEDNESDAY, 28 July 2004**

17:00 Poster Session 6

*Other Materials*

Chairman: Peter Clarke

Venue: Hall D

*Solid State Power Synthesis and Thermoelectric Properties of Zn<sub>4</sub>Sb<sub>3</sub>*, Soon-Chul Ur

*Preparation and Thermoelectric Properties of Misfit Layer Sulfides [Ln<sub>2</sub>S<sub>2</sub>]<sub>p</sub>NbS<sub>2</sub>*, Y. Miyazaki, H. Ogawa, T. Kajitani

*Thermoelectric Properties of Polycrystalline Transition-Metal Dichalcogenides TiS<sub>2</sub> Synthesized by Chemical Vapor Transport Technique*, M. Koyano, H. Nishiate

*Crystal Structure and Electrotransport Properties of Solid Solutions Based on R<sub>3</sub>Cu<sub>3</sub>Sb<sub>4</sub> Compounds (R- Rare Earths)*, A. Horyn, V. Romaka, Yu. Stadnyk, L. Romaka, Yu. Gorelenko

*Numerical Analysis of Thermoelectric Properties of Bismuth Under Magnetic Field*, T. Komine, Y. Hasegawa, Y. Ishikawa, H. Morita, H. Shirai, R. Sugita, T. Muranoi

*Exploratory Study of Semiconducting Chimney-Ladder Phase Compounds on the Basis of the Calculated Electronic Densities of States*, Y. Imai, A. Watanabe, T. Tsuchiya, T. Kumagai, S. Mizuta

*Thermoelectric Properties of Zn<sub>4+x</sub>Sb<sub>3-x</sub> Compounds*, Go Nakamoto, Noriyuki Akai, Makio Kurisu

*Analysis of Carrier Density and Mobility of Polycrystalline Bi Dominated by Impurity Scattering of Carrier*, Yoshiaki Ishikawa, Yasuhiro Hasegawa, Hiroyuki Morita, Takashi Komine, Hajime Shirai

*Numerical Calculation of Magneto-Seebeck Coefficient of Bismuth under a Magnetic Field*, Yasuhiro Hasegawa, Takashi Komine, Yoshiaki Ishikawa, Hiroyuki Morita, Hajime Shirai

*Transport Properties of Bi-Sb Sintered Alloys Prepared by Spark Plasma Sintering*, Yong-Hoon Lee, T. Koyanagi, H. Fujishiro

*The Effect of Side Chain Size on Thermoelectric Properties of Polythiophenes*, Y. Shinohara, K. Ohara, Y. Imai, Y. Isoda, H. Nakanishi

*Thermoelectric Properties of Half-Heusler Zr<sub>1-x</sub>Y<sub>x</sub>Nb<sub>y</sub>NiSn*, Shigeru Katsuyama, Toshiaki Shimizu, Mikio Ito, Shigeta Hara

*Thermoelectric Properties of Titanium-, Zirconium-, Hafnium-, and Alkali-Metal-Doped Lanthanum Sesquisulfide with Th<sub>3</sub>P<sub>4</sub> Type Structure*, Michihiro Ohta, Shinji Hirai, Toshiyuki Nishimura, Yoichiro Uemura

*Structural Refinement for (Zn, Cd)Sb Compounds Grown by Vacuum Casting Method*, Takeshi Souma, Michitaka Ohtaki

*The Role of Dislocation Scattering in Diffusion Thermopower of GaN heterostructures*, N.S.Sankeshwar, M.D.Kamatagi, B.G.Mulimani

**THURSDAY, 29 July 2004**

08:00 Conference Desk Open

09:00 Plenary Session 7

Chairman: Rama Venkatasubramanian  
Venue: Hall C

*Technologies Competing with Thermoelectrics*, Ö. Göl, B. Sobhi-Najafabadi, M. Pathegama

*Japanese National Project - Development for Advanced Thermoelectric Conversion System*,  
T.Kajikawa, M.Ozaki, T.Ito, K.Yamaguchi

*Composition and Nanostructure, Processing and Performance: Narrowing and Expanding the  
Dimensions of Thermoelectrics for Power Generation*, Mihal E. Gross

10:30 Morning Break

**Venue:** Hall D

11:00 Panel Discussion

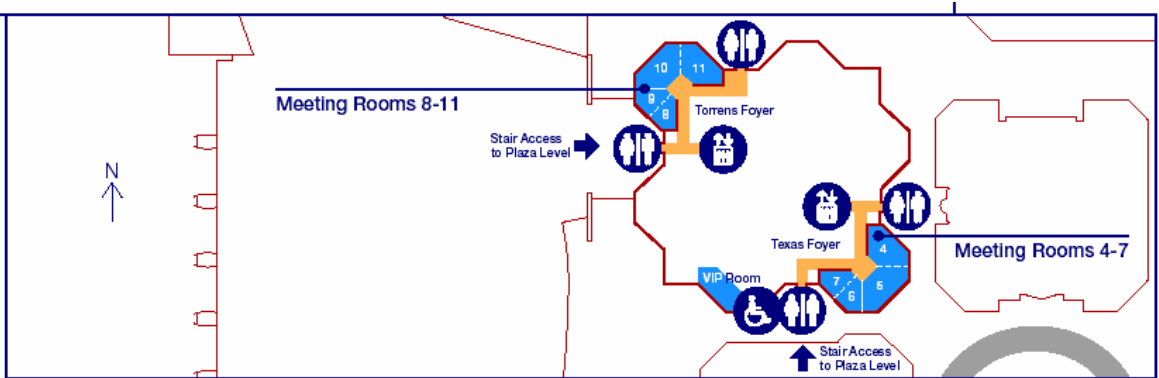
*New thermoelectric materials and effects:  
technology- applications - time scale*

Chairman: *John Stockholm*

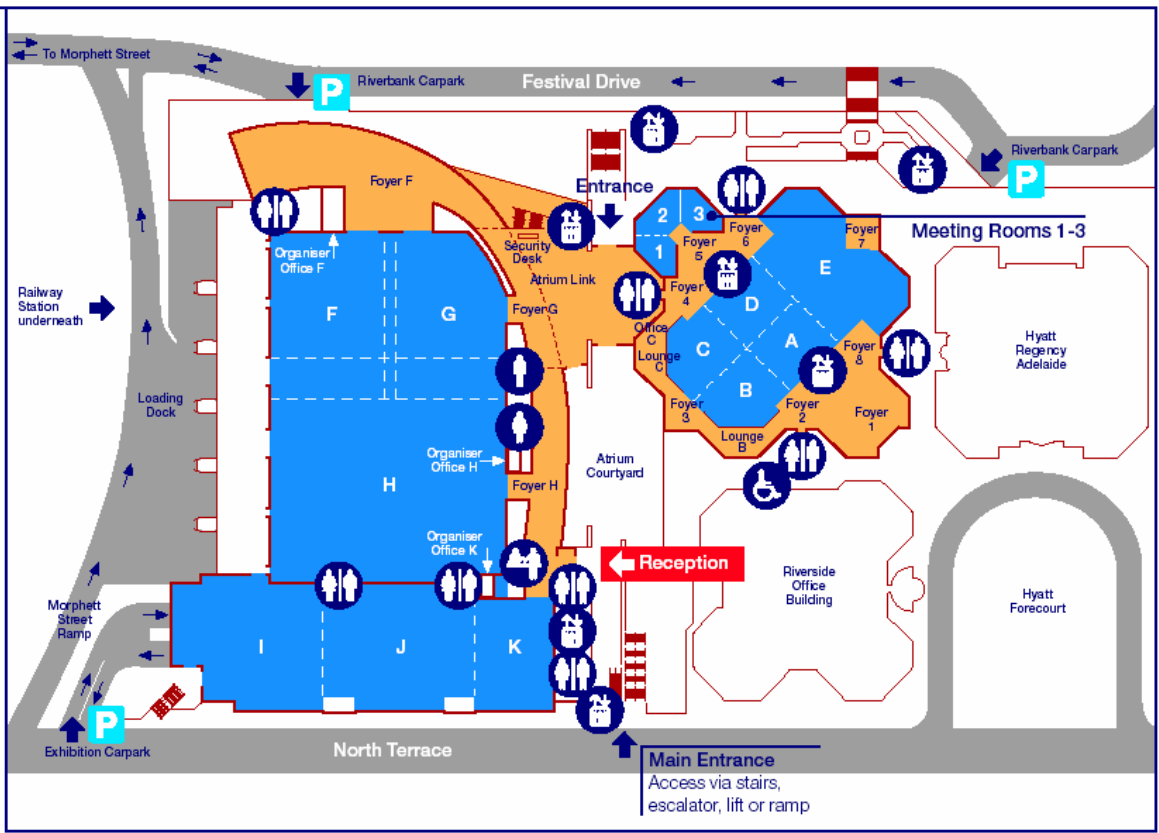
Panel Members: *Harald Böttner, Jean-Pierre Fleurial, Julian Goldsmid,  
Kunihito Koumoto, Ali Shakouri, Cronin Vining*

12:30 Closing Ceremony

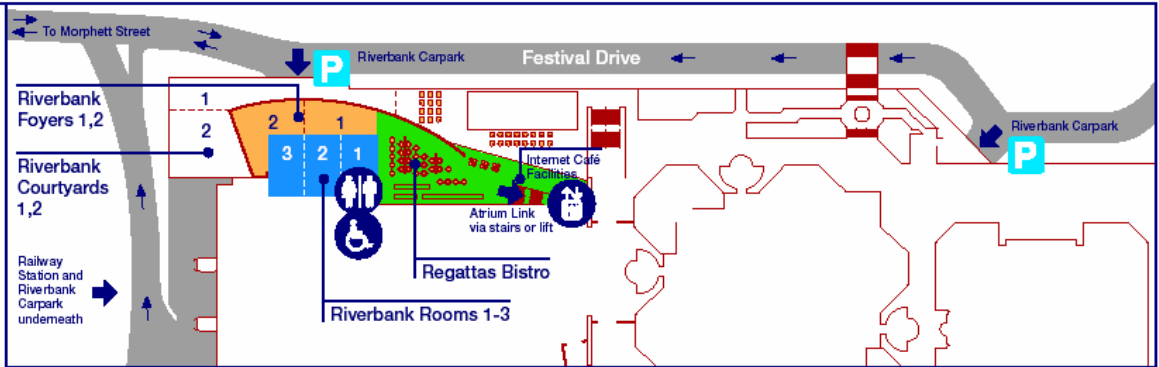
# Level One



# Plaza Level



# Riverbank Level



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- ◆ Exhibition Car Park, situated under the Exhibition Hall, enter from North Terrace near Morphett Street Bridge; and
- ◆ Riverbank Car Park, directly underneath the Adelaide Convention Centre, enter from Festival Drive, off King William Street or from Station Road, off North Terrace, between Skycity Casino and Parliament House.

Car Park Cards: are available by contacting the Car Park Manager on 8210 6740.

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In the event of an emergency, such as fire, bomb threat, etc., Adelaide Convention Centre staff will direct guests accordingly.

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A facsimile service is available at the Adelaide Convention Centre Reception Desk. Please see our Receptionist for costs associated with this service.

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Internet Café facilities are available adjacent to Regattas Bistro.

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The Adelaide Convention Centre has access to an on-call doctor during business hours. This doctor is available to visit the Centre if necessary or, if the guest is well enough, it is 5 minutes to the clinic. The Centre is only approximately 4 minutes from the Royal Adelaide Hospital in the case of an emergency or approximately 10 minutes from the Wakefield Private Hospital. Any medical requirements should be directed to the Adelaide Convention Centre receptionist who will contact the appropriate person.

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The Conference Office/Registration area or Adelaide Convention Centre Reception Desk will receive messages by telephone or fax for registrants/delegates through the Adelaide Convention Centre switchboard. A message board is situated near the Registration Desk and should be checked regularly. Telephone: (61 8) **8212 4099** Facsimile: (61 8) **8212 5101**

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### REGATTAS BISTRO

Regattas Bistro is located on the northern side of the Adelaide Convention Centre complex, on the Riverbank level, with views over the River Torrens. Regattas is open 7 days a week for breakfast, lunch and dinner, with light snacks, coffee, cake and beverages available at all times. Regattas Bistro is available for individual bookings up to 20 persons, but can not be exclusively booked for private functions. Reservations may be made by calling the Bistro direct on **8210 6785**.

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