



GEORAMAN 2004

6th International Conference on Raman Spectroscopy Applied to the Earth and Planetary Sciences

June 6–11, 2004 • Honolulu, Hawai‘i, USA

PRELIMINARY TECHNICAL PROGRAM

Sunday, June 6, 2004

Registration

Registration and reception 18:00-20:00
Ilima Room
Radisson Waikiki Prince Kuhio Hotel
 (2500 Kuhio Avenue, Honolulu).

Monday, June 7th, 2004

Opening Ceremony

8:30 Welcome and Introductory Remarks J. Jehlicka (President of IGCC)

Plenary Session 9:00 - 10:00 Chair: S. K. Sharma

9:00 Raman Spectroscopic Detection of Biogeological Molecular Signatures in Terrestrial Extremophiles of Relevance to Martian Planetary Exploration H. G. M. Edwards, C. D. Moody, and S. E. Jorge Villar (Invited)

9:30 Raman Micromapping of Physical and/or Chemical Transformations of Minerals of Interest in Geology or Archaeology D. C. Smith (Invited)

Coffee Break 10:00 - 10:30

Planetary I 10:30 - 12:00 Chairs: R. Frost and A. Wang

10:30 Laser Raman Spectroscopy for Surface Mineralogy, Alteration Processes, and Biomarkers on Mars A. Wang, L. A. Haskin (Invited)

11:00 Efficiency of a Remote Raman System for Planetary Exploration J. D. Stopar, P. G. Lucey, S. K. Sharma, A. K. Mishra, G. J. Taylor, and H. W. Hubble

11:20 Laser-Raman Studies on Carbonaceous Matter: Application to Earth and Planetary Sciences S. R. Sharma and G. Parthasarathy

11:40 Post-accretion Effects on Organic Matter in Pristine Chondrites E. Quirico

Lunch Break 12:00 - 13:15

Environmental and Archeological Raman Applications 13:15 - 16:05 Chairs: D. Smith and P. Vandenberg

13:15 Application of Raman Micro-Spectroscopy in Environmental Science: From Clay Minerals to Analysis of Airborne Particulate Matter M. S. Odziemkowski, R. W. Gillham, E. J. Reardon, R. Fagan and J. Pawliszyn (Invited)

Monday, June 7th, 2004

| | | |
|-------|---|---|
| 13:45 | Application of a Mobile Raman Spectrometer for Art Analysis | <u>P. Vandenabeele</u> and L. Moens (Invited) |
| 14:15 | Active Raman Remote Sensing of Earth's Atmosphere | <u>D. M. Tratt</u> , D. N. Whiteman, R. W. Farley, and J. E. Wessel (Invited) |

Coffee Break**14:45 - 15:15**

| | | |
|-------|--|--|
| 15:15 | TBA | <u>S. Pages-Camagna</u> |
| 15:45 | Improvements in Wallpaper Industry During the Second Half of the 19 th Century: Micro-Raman Spectroscopy Analysis of Pigmented Wallpapers | K. Castro, <u>P. Vandenabeele</u> , M. D. Rodríguez-Laso, L. Moens and J. M. Madariaga |

Tuesday, June 8th, 2004

Earth and Planetary Raman Spectroscopy/Instrumentation**8:30 - 10:00** Chair: F. Rull and D. M. Tratt

| | | |
|-------|---|--|
| 8:30 | Standoff Raman Measurements using Fiber-coupled Dispersive and Tunable Filter Spectrometers: A Discussion of Techniques and Experimental Issues | <u>S. M. Angel</u> , S. Burnett, J. Scaffidi, S. K. Sharma, and J. C. Carter (Invited) |
| 9:00 | Raman Confocal Microscopy of Microcrystalline Cuprous Oxide Inclusions in Assyrian Glass | I. Kudryashov, P. Rutkovski, S. Suruga, <u>J. Roberts</u> , and N. Nagasawa (Invited) |
| 9:30 | Miniature Laser for Remote Raman and Fluorescence Spectroscopy of Martian Surface | <u>U. N. Singh</u> , F. Hovis, S. K. Sharma, and S. Ismail (Invited) |
| 10:00 | Combined Instrumentation for Remote Raman Spectroscopy and Laser-Induced Breakdown Spectroscopy (LIBS) | R. C. Wiens, <u>S. K. Sharma</u> , D. A. Cremers, and P. G. Lucey (Invited) |

Coffee Break**10:30 - 11:00**

Earth and Planetary Raman Spectroscopy/Instrumentation**11:00 - 12:10** Chairs: C. F. Windisch and C. H. Chio

| | | |
|-------|--|--|
| 11:00 | Active Optical Remote Sensing Technologies for Earth and Planetary Science | <u>U. Singh</u> (Invited) |
| 11:30 | Use of a Microscope Objective Corrected for a Cover Glass to Improve Confocal Spatial Resolution inside a Sample with Finite Index of Refraction | <u>E. P. Leroy</u> , F. Adar, C. Naudin, A. Whitley, and B. Bodnar |
| 11:50 | Low Temperature Raman-spectroscopy with Fluid Inclusions: Fundamental Properties of Water and Brines | <u>R. J. Bakker</u> |

Lunch Break**12:10 - 13:15**

Poster Session**13:15 - 16:00** Chairs: A. Krot and A. Misra

Raman Spectroscopy of Iowaite and Other Hydrotalcites

R. L. Frost and K. L. Erickson

| | |
|---|---|
| Peisleyite an Unusual Mixed Anion Mineral: -- a Raman Spectroscopic Study | <u>R. L. Frost</u> , S. J. Mills, K. L. Erickson and M. L. Weier |
| Raman of Sands and Mud from Shallow Ocean | <u>P. Fryer</u> , R. H. Wilkens, A. K. Misra and S. K. Sharma |
| Evaluation of Raman spectroscopy to detect fullerenes in geological materials | <u>J. Jehlicka</u> , O. Frank, J-M. Bény, and J. Pokorn_ |
| A Raman Spectroscopic Evaluation of Extremophiles at Different Wavelengths | <u>S. E. Jorge Villar</u> , H. G. M. Edwards |
| Raman Spectroscopic Analysis of Pigments from Roman Villa Excavations | <u>S. E. Jorge Villar</u> , H. G. M. Edwards, N. F. Hassan and P. S. Middleton |
| Raman Spectroscopy of Metamorphic Diamonds from the Kokchetav Massif | A. V. Korsakov, <u>P. Vandenabeele</u> , and K. Theunissen |
| Application of Raman Spectroscopy to the Investigation of Shocked Rock and Associated Lichen from the Haughton Crater | <u>C. D. Moody</u> , H. G. M. Edwards, C. Cockell |
| Biogeological Raman Spectroscopic Studies of Antarctic Lacustrine Sediments | <u>C. D. Moody</u> , S. E. Jorge Villar, H. G. M. Edwards, D. A. Hodgson, P. T. Doran, J. L. Bishop |
| Pressure Response of Raman Spectra of Liquid Water and Its Implications for Change in Hydrogen Bond Interactions | <u>T. Okada</u> , H. Kagi, K. Komatsu, T. Kawamoto and T. Yamanaka |
| An Intermediate γ -CaSO ₄ Phase in Dehydration Process of Gypsum | <u>P. S. R. Prasad</u> , V. K. Chaitanya, K. S. Prasad, and D. N. Rao |
| Maturation Grade of Coal Samples as Revealed by Raman Spectroscopy | <u>E. Quirico</u> , J.-N. Rouzaud, P.-I. Raynal, C. Clinard, L. Bonal, and G. Montagnac |
| UV Raman Excitation Profile of Ribonuclease A: Determination of Protein Secondary Structure | <u>B. Sharma</u> , S. Bykov, A. Murza, and S. A. Asher |
| Raman Spectroscopic Characterization of Martian Meteorites | <u>G. Simon</u> , R. Hochleitner, N. Tarcea, and J. Popp |
| Non-destructive Semi-quantitative Chemical Analysis of a Garnet Gemstone by Raman Microscopy compared with Analysis by PIXE | <u>D. C. Smith</u> |
| Raman Spectroscopic Analysis of the Maya Wall Paintings in Ek'Balam | <u>P. Vandenabeele</u> , S. Bodé, A. Alonso, and L. Moens |

Wednesday, June 9th, 2004

| | | |
|------|---|---|
| | Diamonds and Gemstones | 8:30 – 9:40 Chair: J. Hu and L. Kiefert |
| 8:30 | Gemstone Analysis with Raman Spectroscopy | <u>L. Kiefert</u> (Invited) |
| 9:00 | Identification of the Diamond-like Cubic Phases by Confocal Raman | <u>P. V. Zinin</u> , Kudryashov, N. Konishi, V. L. Solozhenko, S. K. Sharma, and L. C. Ming |

Wednesday, June 9th, 2004

| | | |
|--|---|--|
| 9:20 | Micro-Raman Study of Fluid-bearing Micro-inclusions in Fibrous Diamonds | <u>D. A. Zedgenizov</u> , H. Kagi, and V. S. Shatsky |
| Coffee Break | | 9:40 - 10:20 |
| Planetary II | | 10:20 - 11:50 Chairs: A. Wang and T. Mernagh |
| 10:20 | A Micro-Raman Spectroscopic Study of Allende Carbonaceous Chondrite | <u>F. Rull</u> , J. Martínez-Frias |
| 10:40 | Petrologic Type of CV3 as Revealed by Raman Spectroscopy of Organic Matter | <u>L. Bonal</u> , E. Quirico, M. Bourot-Denise, and G. Montagnac (Invited) |
| 11:10 | Micro-Raman and Petrologic Study of Shock-induced High Pressure Minerals in Taiban Meteorite | <u>E. R. D. Scott</u> , S. K. Sharma, and C. H. Chio |
| 11:30 | Speed of Sound by Laser-induced Transient Grating Measurements | B. Streetman, M. Whitehead, <u>R. Sander</u> , D. Schiferl, G. Quigley, R. Oldenberg, E. Walters |
| Lunch Break | | 12:00 - 13:15 |
| High-Pressure and Temperature Raman Studies | | 13:15 – 16:45 Chairs: H. Edwards, and D. Muenow |
| 13:15 | The Vibrational and Elastic Properties of Fe and Co Studied by Raman Spectroscopy and Impulsive Stimulated Light Scattering | <u>A. F. Goncharov</u> , J. C. Crowhurst, and J. M. Zaug (Invited) |
| 13:45 | Vibrational Spectroscopy in Diamond Anvil Cells | <u>B. D. Streetman</u> , R. K. Sander, M. C. Whitehead, E. Walters, D. Schiferl, G. K. Anderson, and R. C. Oldenberg (Invited) |
| 14:15 | X-ray Diffraction and Raman Measurements of CuGeO ₃ Under High Pressures | <u>L. C. Ming</u> , S. K. Sharma, Y. Nakamoto, E. Suzuki, S. Endo, V. Prakapenka, D. Yang, and A. J. Jayaraman |
| 14:35 | In situ Raman Study of Planetary Interiors Under Extremely High Pressures and Temperatures | <u>J.-F. Lin</u> , M. Santoro, B. Militzer, V. V. Struzhkin, E. Gregoryanz, H.-K. Mao, R. J. Hemley |
| Coffee Break | | 14:55 - 15:15 |
| 15:15 | Portable Remote Raman System for Monitoring Hydrocarbon in the Environment | <u>S. K. Sharma</u> , A. K. Misra, B. Sharma (Invited) |
| 15:45 | Raman Micro-spectroscopy and 2D-tomography for the Investigation of Residual Pressure around Mineral Inclusions in Copeton Diamonds | <u>T. P. Mernagh</u> , L. M. Barron, and B. J. Barron |
| 16:05 | Micro-Raman Studies of Hydrrous Ferrous Sulfates and Jarosites | <u>C. H. Chio</u> , S. K. Sharma, and D. W. Muenow |
| 16:25 | High-Pressure Raman Scattering Studies of Single-Crystal B ₄ C and SiC | <u>M. H. Manghnani</u> , Y. Wang, V. Vijayakumar and J.L. Zhu |

Thursday, June 10th, 2004

| | | |
|-------|--|--|
| | Raman Applications in Mineralogy | 9:00 - 10:20 Chair: S. K. Sharma and J. Jehli_ka |
| 8:30 | Raman Spectroscopic Study of Amorphous and Crystalline Hydrocarbons from Soils, Peat and Lignitic Shale | <u>J. Jehli_ka</u> , S. E. Jorge Villar, H. G. M. Edwards, and J. Pokorny (Invited) |
| 9:00 | A Comparative Analysis of Mineral Sulphates from Rio Tinto and Jaroso Ravin (Spain) using XRD, FTIR and Raman Spectroscopy | <u>F. Rull-Perez</u> , J. Martinez-Frias, J. Medina, A. Sanz, E. Gonzalez-Pastor (Invited) |
| 9:30 | Hot Stage Raman Spectroscopic Study of Sabugalite | <u>R. L. Frost</u> and M. L. Weier (Invited) |
| 10.00 | Pulsed Remote Raman System for Daytime Measurements of Mineral Spectra | <u>A. K. Misra</u> , S. K. Sharma, C. H. Chio, P. G. Lucey, and B. Lienert |
| | Coffee Break | 10:20 - 10:40 |
| | Raman Applications in Mineralogy II | 10:40 - 12:15 Chairs: P. Zinin and L. C. Ming |
| 10:40 | Determining Structure in Nickel Cobalt Oxide with Vibrational Spectroscopy | <u>C. F. Windisch Jr.</u> , G. J. Exarhos, and R. R. Owings (Invited) |
| 11:10 | Raman Spectroscopy of Atomic-layer-deposited ZrO ₂ and HfO ₂ Thin Films | <u>S. N. Tkachev</u> , M. H. Manghnani, A. Niilisk, J. Aarik, and H. Mandar |
| 11:30 | Raman Spectroscopic Measurements on Gas Hydrates — Source of Information about Molecular Interactions, Structures and Compositions | <u>J. M. Schicks</u> , J. Erzinger |
| 11:50 | Application of Moissanite Anvil Cells for Raman Spectroscopic Determinations in Earth Sciences | J. Xu, H. K. Mao and R. J. Hemley (Invited) |
| | Lunch Break | 12:15 |
| | Conference Dinner Halekulani Hotel, 2199 Kalia Road, Waikiki | 18:00 cash bar 19:00 dinner |

Friday, June 11th, 2004

8:00 Field trip around Southeast Oahu