

Full Biography

Robert Keller Vincent

Department of Geology 122 N. Maple St.
Bowling Green State University Bowling Green, OH 43402
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I. Academic Degrees and Honors

Ph.D. in Geology (1973)

Department of Geology and Mineralogy
University of Michigan
Ann Arbor, Michigan 48105

Dissertation: "A Thermal Infrared Ratio Imaging Method for Mapping
Compositional Variations Among Silicate Rock Types"

Honors: Sigma Xi

M.S. in Physics (1966)

Department of Physics
Institute for Molecular Physics
University of Maryland
College Park, Maryland

Thesis: "Electrical Conductivity Changes Caused by Pressure-Induced Phase Changes in
KBr and KI"

(Note: This title may not be exact; no copy of the thesis is still in my possession)

Graduate Teaching Asst. and Graduate Research Asst.

B.S. in Physics (1963)

B.A. in Mathematics (1963)

Department of Physics
Department of Mathematics
Louisiana Tech University
Ruston, Louisiana

Honors: Cum Laude in Both Degrees, Omicron Delta Kappa,

ΦΚΦ, Distinguished Military Graduate (AFROTC), One of 237 (out of over a 1,000
American scientists that applied) selected for the first annual Scientists Helping America
Conference in Washington, DC from March 11-13, 2002, hosted by DARPA.

2004 Olscamp Research Award (Bowling Green State University). The Olscamp Research Award is
presented annually to a faculty member at BGSU for outstanding scholarly or creative
accomplishments during the previous three years.

2006 United States Patent 7132254, Nov. 7, 2006, Awarded to Bowling Green State University,
Robert K. Vincent, Inventor: Method and Apparatus for Detecting Phycocyanin-Pigmented Algae
and Bacteria from Reflected Light.

II. Academic Positions

February, 2001-June, 2003: Director, OhioView (a remote sensing consortium of 11 research universities in Ohio).

May, 2000-Present: Professor, Department of Geology, Bowling Green State University, Bowling Green, Ohio 43403.

August, 1993- May, 2000: Associate Professor, Department of Geology, Bowling Green State University, Bowling Green, Ohio 43403.

III. Non-Academic Positions

2008-Present: Co-founder, Chief Technical Officer of Crosshair Technologies, Inc. St Marys, OH.

2007-Present: Founder, Chief Technical Officer of Blue Water Satellite, Inc., Bowling Green, OH.

1974-1999: Founder, Chairman of the Board, and President of GeoSpectra Corporation, formerly of Ann Arbor, Michigan, now at 122 N. Maple St., Bowling Green, Ohio 43402.

1981-1986: Founder and past Board Director of BioImage Corporation, Ann Arbor, Michigan (sold to Kodak in 1986, resold to Millipore in 1989, still in Ann Arbor).

1970-1974: Research Geophysicist at Willow Run Laboratories of the University of Michigan, changed to the Environmental Research Institute of Michigan (ERIM) in January, 1973. Principal Investigator on LANDSAT I and Skylab Geological Remote Sensing Experiments, under contract to NASA during this time.

1966-1970: Captain, USAF, General Physicist, Lunar-Planetary Research Branch, Space Physics Laboratory, Air Force Cambridge Research Laboratories, L.G. Hanscom Field, Bedford, Massachusetts.

1963-1965 (Summers): Summer Development Student, Texas Instruments, Inc., Richardson, Texas.

1961 (Summer): Engineering Assistant, United Gas Research Lab, Shreveport, Louisiana.

IV. Publications

Books Published Since 1993

Vincent, R. K., Synthetic Aperture Radar (Land Surface Applications), In Volume 5 of Encyclopedia of Atmospheric Sciences, Edited by James R. Holton, John A. Pyle and Judith A. Curry, ISBN: 0-12-227090-8, Academic Press, Elsevier Science, London, UK, pp. 1851-1858, 2003.

Vincent, R. K., Fundamentals of Geological and Environmental Remote Sensing, Prentice Hall, Upper Saddle River, New Jersey, 400 pp., 1997. (Sole author of all 10 chapters.)

Published Refereed Articles-Journals Since 1993

Patel, Jigar, Qiong Zhang, Zhaohui Xu, Michael McKay, Robert Vincent, Genetic engineering of *Caulobacter crescentus* for bioremediation of heavy metals, Submitted to ??, 2008.

Sridhar, B. B. Maruthi, Robert K. Vincent, Jason D. Witter and Alison L. Spongeberg, Mapping Total Phosphorus Concentration of Surface Soils With LANDSAT TM Data, Submitted to Science of the Total Environment, 2008.

Sridhar, B.B. Maruthi, T.L. Chapin, R.K. Vincent, M.J. Axe, J.P. Frizado, Identifying the effects of different construction practices on the spectral characteristics of concrete, *Cement and Concrete Research*, 38 (4), p.538-542, Apr 2008.

Khuder, Sadik, Sheryl Milz, Michael Bisesi, Robert Vincent, Wendy McNulty, and Kevin Czajkowski, Health Survey of Residents Living Near Biosolids Permitted Farm Fields, *Archives of Environmental and Occupational Health*, Vol. 42, No. 1, pp. 5-11, 2007. (McNulty is my former student)

Perry, Jason L., and R. K. Vincent, ASTER Brightness and Ratio Codes for Minerals: Application to Lithologic Mapping In West-Central Powder River Basin, Wyoming, Submitted to SEG Special Publications, 2007. (Former Student)

Sridhar, B.B.M., and R. K. Vincent, Spectral reflectance measurements of a *Microcystis* bloom in Upper Klamath Lake, Oregon, International Assoc. of Great Lakes Research, *Journal of Great Lakes Research*, 33: 279-284, 2007.

Evans, J. E., J. M. Huxley, and R. K. Vincent, Upstream Channel Changes Following Dam Construction and Removal Using a GIS/Remote Sensing Approach, Journal of the American Water Resources Association, Vol. 43, No. 2, pp. 1-14, 2007.

Dash, P., R. K. Vincent, and M. M. Al-Rshaidat, SeaWiFS Algorithm for Mapping Phycocyanin in Incipient Freshwater Cyanobacterial Blooms, Submitted to *Great Lakes Research*, 2006. (Former Student).

Huxley, J. M., J. E. Evans, and R. K. Vincent, Impact of Dam Construction and subsequent Removal of the Size and Position of Upstream Sand-Gravel Bars, Huron River, Ohio, Over the Interval 1958-2003, Submitted to Journal of the American Water Resources Association, 2005.

Beck, R. A., R. K. Vincent, D. W. Watts, M. A. Seibert, D. P. Pleva, M. A. Cauley, C. T. Ramos, T. M. Scott, D. W. Harter, M. Vickerman, D. Irmies, A. Tucholski, B. Frantz, G. Lindamood, I. Lopez, G. Follen, T. Kollar, J. Horowitz, R. Griffin, R. Gilstrap, M. Johnson, K. Freeman, C. Banaag, J. Kosmo, A. Ross, K. Groneman, J. Graham, K. Shillcutt, R. Hirsh, and N. Howard, A Space-BASED End-to-End Prototype Geographic Info. Network for Lunar and Planetary Exploration and Emergency Response (2002 and 2003 Field Exper.), Computer Networks, V. 47/5, pp. 765-783, 2005.

Vincent, R.K., and N. S. Levine, Future Directions for Geological Remote Sensing and Geographical Information Systems (GIS) in Geological Education, Environmental & Engineering Geoscience, Vol. X, No. 4, pp. 313-322, 2004.

Academic Vitae
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Vincent, R.K., and D. L. Jennings, A Four-State Field Evaluation of the Boeing Landing Suitability Index (BLSI) for Automatically Mapping Candidate Aircraft Operating Sites in Natural Terrain from LANDSAT TM Data, Journal of Terramechanics, Vol. 41, No. 2-3, pp. 151-162, 2004.

Vincent, R.K., X. Qin, R. M. L. McKay, J. Miner, K. Czajkowski, J. Savino, and T. Bridgeman, Phycocyanin Detection from LANDSAT TM Data for Mapping Cyanobacterial Blooms in Lake Erie, Remote Sensing of Environment, Vol. 89, No. 3, pp 381-392, 2004.

Vincent, R.K., Z. Zheng, P. Shen, and S. Zhang, Wavelet Packet Transformation Analysis of Seismic Signals Recorded from a Tornado in Ohio, Bulletin of the Seismological Society of America, Vol. 92, No. 6, pp. 2352-2368, 2002.

Vincent, R.K., Forecasts of Monthly-Averaged Daily Temperature Highs in Bowling Green, Ohio from Monthly Sea Surface Temperature Anomalies in the Eastern Pacific Ocean During the Previous Year, Photogrammetric Engineering and Remote Sensing, V. 66, No. 8, pp. 1001-1009, 2000.

Robinson, J., R. Beck, E. Gnos, and R.K. Vincent, New Structural and Stratigraphic Insights for Northwest Pakistan from Field and Landsat Thematic Mapper Data, GSA Bulletin, Vol. 112, No. 3, pp. 364-375, 2000. (Joel Robinson was my U. of Miami student.).

Zhizhen, Z., R.K. Vincent, S. Ping, and Y. Xuanhui, Observation Study on Precursory Geosound: Extraction of Nucleation Information in the Earthquake Preparation Process, Earthquake Research in China, Vol. 14, No. 4, pp. 557-562, 1999.

Carman, R.E., and R.K. Vincent, Measurement of Soil Gas and Atmospheric Methane Content on One Active and Two Inactive Landfills in Wood County, Ohio, Environmental and Engineering Geoscience, published by Association of Engineering Geologists, Vol. IV, No. 3, pp.317-329, 1998. (Former Student).

Carman, R.E., and R.K. Vincent, Reply: Measurement of Soil Gas and Atmospheric Methane Content on One Active and Two Inactive Landfills in Wood County, Ohio, Environmental and Engineering Geoscience, published by Association of Engineering Geologists, Vol. V, No. 3, Fall, 1999 issue. (Former Student).

Vincent, R.K., 1994, Remote Sensing for Solid Waste Landfills and Hazardous Waste Sites, Photogrammetric Engineering & Remote Sensing, Vol. 60, No. 8, pp. 979-982.

Published Refereed Articles -Proceedings Since 1993

Vincent, R. K., R. Michael McKay, Mamoon M. D. Al-Rshaidat, Kevin Czajkowski, Thomas Bridgeman, and Jeffrey Savino, 2005, Mapping The Bacterial Content of Surface Waters with LANDSAT TM Data: Importance for Monitoring Global Surface Sources of Potable Water, Proceedings of the 16th Pecora Conference on Global Priorities in Land Remote Sensing, Sioux Falls, SD, October 23-27, 2005, pp83-86.

Dash, Padmanava (former student), and R. K. Vincent, 2005, Computer Animation of Cyanobacteria Blooms in Lake Erie from July-October, 2003, As Mapped from SeaWiFS Data with a New Phycocyanin Algorithm, Submitted to the Proceedings of the 16th Pecora Conference on Global Priorities in Land Remote Sensing, Sioux Falls, SD, October 23-27, 2005, pp21-25.

Vincent, R.K., and D. L. Jennings, A Four-State Field Evaluation of the Boeing Landing Suitability Index (BLSI) for Automatically Mapping Candidate Aircraft Operating Sites in Natural Terrain from LANDSAT TM Data, Invited Paper, Proceedings of the 14th International Conference of the International Society for Terrain-Vehicle Systems, Vicksburg, MS, USA, October 20 – 24, 2002. (Refereed proceedings; award-winning paper)

Vincent, R.K., Possible Application of “Passive Radar” for the Detection and Tracking of Tornadoes, Invited Paper, Proceedings of the Multinational Conference on “Passive and Covert Radar 2002”, Jun 18-20, 2002, Roke-Manor Research LTD, United Kingdom, 2002.

Vincent, R.K., C. M. Baquero-Garcia, N. S. Levine, LANDSAT TM Assessment of Cropland Loss Due to Urbanization in NW Ohio, Proceedings of the American Soc. of Photogrammetry and Remote Sensing (ASPRS) Annual Conference for 2002, Washington, DC, April, 2002.

Birnbach, C. and R.K. Vincent, The Quantum Ferroelectric Hyperspectral Imager, Proceedings of the IEEE Aerospace Conference, March 6-13, 1999, Snowmass, CO, V. 3, pp. 391-399.

Expanding Horizons For Geological Applications Of Multispectral And Hyperspectral Remote Sensing Data, 1999, (Invited Paper), R.K. Vincent, Proceedings of the Thirteenth International Conference on Applied Geologic Remote Sensing, Mar. 1-3 meeting, 1999, Vancouver, BC, Canada, Vol. I, pp. 118-125.

Jengo, C.M., and R.K. Vincent, Hyperspectral Imaging of Ancient Hydrocarbon Seeps in the Wind River Basin, Wyoming, Proceedings of the Thirteenth International Conference on Applied Geologic Remote Sensing, Mar. 1-3 meeting, 1999, Vancouver, BC, Canada, Vol. I, pp. 118-125. (Former Student and 2nd Runner Up in BGSU Shanklin Award, 1998)

Kimlicko, Michael E., J.P. Frizado, and R.K. Vincent, 1997, High-Resolution Digital Elevation Model Application to the Delineation of River Flood Extent, Proc. of the Twelfth International Conference for Applied Geologic Remote Sensing, Vol. I, pp. 149-156. (Former student)

Barniak, V.J., R.K. Vincent, J. Mancuso, and T.J. Ashbaugh, 1996, Comparison of a Gold Prospect in Churchill County, Nevada with a Known Gold Deposit in Mineral County, Nevada from Laboratory Measurements and LANDSAT TM Images, Proceedings of the Eleventh Thematic conference on Applied Geologic Remote Sensing, Environmental Research Institute of Michigan, Ann Arbor, Michigan, Vol. II, pp. 188-197. Abstract Reviewed. (Former Student; This paper won Best Student Paper Award and Vanessa was Runner-up for BGSU Shanklin Award, 1996)

Vincent, R.K., 1995, Flying Falcon: Multispectral Thermal IR Geological Imaging Experiment, Remote Sensing for Oil Exploration and Environment, Proceedings of the Space Congress, Bremen, Germany, May 23-24, 1995, published by European Space Report, Box 140 280, 80452 Munich, Germany, pp. 139-146. (Note: This was an invited paper.)

Presentations at Professional Meetings Since 1993

Vincent, Robert K. and Majid H. Tangestani, Improved rock units discrimination using ASTER data of the Neyriz ophiolite, NW Iran, and its potential in prospecting for chromite deposits, Exploration 07 Workshop on Hyperspectral Remote Sensing, Toronto, Canada, September 9, 2007.

Borton, TiffanyAnn, Vincent, Robert K., and Onasch, Charles, A Method for Locating Abandoned Oil Wells In Wood County, Ohio Using Remote Sensing and Geophysical Techniques, Joint South-Central and North-Central Geological Society of America Sections, April 11-13, 2007.

Knierim, Katherine, Gomezdelcampo, Enrique, Vincent, Robert K., and Mateer, Melissa, Spectroscopic Analysis of Clay Alteration and Vegetation in the North Screamer Area, Barrick Goldstrike Property, Joint South-Central and North-Central Geological Society of America Sections, April 11-13, 2007.

Vincent, Robert K., 2006, The Critical Need for Future Mid-Resolution Thermal Infrared Satellite Sensors, Poster Paper H33E-1558, American Geophysical Union Fall Meeting (Dec. 10-14, 2006), San Francisco, CA.

Vincent, Robert K., 2006, Satellite Monitoring of Incipient Cyanobacterial Blooms in the Great Lakes, GSA North-Central Section—40th Annual Meeting (20–21 April 2006), Geological Society of America Abstracts with Programs, Vol. 38, No. 4, p. 7.

Evans, J.E., J. M. Huxley, R. K. Vincent, 2006, Historical Changes in Channel Sinuosity Upstream of a Low-Head Dam, Huron River, North-Central Ohio, GSA North-Central Section—40th Annual Meeting (20–21 April 2006), Geological Society of America Abstracts with Programs, Vol. 38, No. 4, p. 20.

Furey, P.C., R.K. Vincent, and R.L. Lowe, Mapping Benthically-Mediated Cyanobacterial Blooms in Lake Erie Using Satellite Remote Sensing, North American Benthological Society Annual Meeting, Lentic Ecology, Vancouver, British Columbia, Canada, 2004.

Vincent, R.K., X. Qin, R. M. L. McKay, J. Miner, K. Czajkowski, T. Bridgeman, and J. Savino, Preliminary Results of Models That Map Coliform and E. Coli Bacteria in Lake Erie and Its Tributaries from LANDSAT TM Data, Ohio Geospatial Technology Conference for Agriculture and Natural Resource Applications, Columbus, OH Mar., 24-26, 2003. (Oral Presentation)

Vincent, R.K., X. Qin, R. M. L. McKay, J. Miner, K. Czajkowski, T. Bridgeman, and J. Savino, Satellite Detection of Phycocyanin as a Precursor of Noxious Microcystis Blooms, American Association of Geographers Meeting, New Orleans, LA, March, 7, 2003. (Oral Presentation)

Vincent, R.K., and N. S. Levine, Future Directions for Geological Remote Sensing and GIS Education, Geological Society of America Annual Meeting and Exposition, Abstracts with Programs, p. 450, 2002. (Presented as Co-Chair of the Remote Sensing Session; submitted to EEG Journal for publication)

Wu, Xiaowen, and R.K. Vincent, Algorithm for Mapping Bare Soil from LANDSAT TM Data in Agricultural Terrain, Geological Society of America Annual Meeting and Exposition, Abstracts with Programs, p. 449, 2002. (Present student) (Presented as Co-Chair of the Remote Sensing Session; submitted to EEG Journal for publication)

Vincent, R.K., C. M. Baquero-Garcia, N. S. Levine, LANDSAT TM Assessment of Cropland Loss Due to Urbanization in NW Ohio, American Soc. of Photogrammetry and Remote Sensing (ASPRS) Annual Conference, Washington, DC, April, 2002. (Former Student)

Baquero, C. M., R.K. Vincent, and N.S. Levine, Geological Controls on Vegetation Reflectance: An Example from Middle Magdalena Basin, Colombia, GSA Annual Meeting and Exposition Abstracts, p. A-289, November, 2001. (Former Student)

Vincent, R.K., N.S. Levine, B. Gerrick, P. Oduor, J. Reed, and D. Jennings, Application of GIS to Field Verification of the LANDSAT TM-Derived Boeing Landing Suitability Index (BLSI): A Case Study, GSA Annual Meeting, November 15, 2000. (Presented as Co-Chair of the Remote Sensing Session).

Hardesty, T., J.R. Valentine, and R.K. Vincent, 1998, Mapping Faults in Quaternary Deposits with LANDSAT TM Data and Ground-Based Gamma-Ray Scintillometer Transects, Poster Paper at GSA Annual Meeting, Toronto, Ontario, October, 1998. (Former Students)

Jengo, C.M., and R.K. Vincent, 1998, Utility of AVIRIS Spectral Band Ratio Codes for Rapid Compositional Identification, Oral Paper at GSA Annual Meeting, Toronto, Ontario, October, 1998. (Former Student)

Vincent, R.K. and V.P. Rybakov, 1998, Prediction of Corn, Wheat, and Soybean Annual Crop Yields in Wood County, Ohio from Monthly Averages of Eastern Pacific Sea Surface Temperatures, Annual Meeting of the American Society of Photogrammetry and Remote Sensing (ASPRS), Tampa, Florida, March, 1998, oral paper. (Former Student, Non-Thesis)

Pierce, R.J., and R.K. Vincent, 1998, Relationship Between Color Infrared Photography and Water-Stained Leaves in Wetland Analyses, poster paper at the Society of Wetland Scientists, 19th Annual Meeting, Anchorage, Alaska.

Vincent, R.K., 1997, Application of Thermal Infrared Remote Sensing to the Mapping of Groundwater Reservoirs in Carbonate Bedrock, Abstract and Oral Paper Presented to the Ohio Academy of Sciences.

Vincent, R.K. and Amy L. Ollendorf, 1997, Creation of High-Resolution DEMs from Remote Sensing Data for Archaeological Stone Circle Applications, Proceedings of Remote Sensing Applications in Archaeology, an international meeting sponsored by St. Cloud State University, NASA, and the Oriental Institute, May 29-31, oral paper.

Robinson, J.E., Gnos, E., Badshah, M.S., Beck, R.A. and Vincent, R.K., 1997, New Geologic Insights for Northwest Pakistan from LANDSAT TM and Field Data: Implications for Copper Prospectivity, GSA Annual Meeting, Salt Lake City, Utah, GSA Abstracts, p. A-40, Poster Paper BTH 42, October 20. (Robinson is Former Student, at U. of Miami)

Vincent, R.K., 1996, Problems with the Delineation of Wetlands from Color Infrared (CIR) Photography, Abstract (Reviewed) and Oral Presentation, Geological Society of America, Annual Meeting, Denver, Colorado, October 29.

Vincent, R.K., J.P. Frizado, and S.D. Mackey, 1995, Comparison of Lake Erie Coastal Erosion Rates as Determined by Digital Photogrammetry and Aerial Photo Interpretation, Abstract (Reviewed) and Oral Presentation, Geological Society of America, Annual Meeting, New Orleans, La., Nov. 8.
Vincent, R.K., C. Birnbach, and A.H. Mengel, 1995, G301: The Flying Falcon Geological Remote Sensing Experiment, 1995 Shuttle Small Payloads Symposium, NASA Conference Publication 3310, pp. 231-240. Abstract Reviewed. I gave it orally at the Symposium on Sept. 27, 1995.

Vincent, R.K., W.R. Laton, and J. Sattler, 1993, Detailed Modeling of Solid Waste Landfill Surface Water run-off from High Resolution Elevation Data Automatically Extracted from Stereo Photos Taken by a Camera on a Tethered Balloon Platform, 1993 Symposium of Remote Sensing in Solid Waste Management, Assoc. of Eng. Geologists, oral paper.

Books Published Prior to 1993

Geochemical Mapping by Spectral Ratioing Methods, Chapter 10, R.K. Vincent, Remote Sensing Applications for Mineral Exploration, Edited by William L. Smith, Dowden, Hutchison & Ross, Inc., Stroudsburg, Pa., 1977, pp. 251-278.

Carter, W.D., W.A. Fischer, A. Stancioff, and R.K. Vincent, Advances in Earth Oriented Applications of Space Technology for Observing the Earth for Mineral Exploration, 1980, Advances in Earth Oriented Applications of Space Technology, Pergamon Press.

Remote Sensing, 1983, edited by K. Watson and R.D. Regan, Society of Exploration Geophysicists.

Refereed Articles-Journals Prior to 1993

Herman, J.D., R.K. Vincent, and B. Drake, 1991, Geological and Geophysical Evaluation of the Region Around Saginaw Bay, Michigan (Central Michigan Basin) with Image Processing Techniques, The Geological Society of America, Early Sedimentary Evolution of the Michigan Basin, Special Paper # 256, pp. 221-240.

Holmes, Q.A., D.R. Nuesch, and R.K. Vincent, 1980, Optimum Thermal Infrared Bands for Mapping General Rock Type and Temperature from Space, Remote Sensing of Environment, Vol. 9, pp. 247-263.

Vincent, R.K., 1977, Uranium Exploration with Computer-Processed LANDSAT Data, Geophysics, Vol. 42, pp. 536-541.

Vincent, R.K., L.C. Rowan, R.E. Gillespie, and C. Knapp, 1975, Thermal-Infrared Spectra and Chemical Analyses of Twenty-Six Igneous Rock Samples, Remote Sensing of Environment, Vol. 4, 1975, pp. 199-209 and also reprinted in Geophysics Reprint Series No. 3: Remote Sensing, 1983, edited by K. Watson and R.D. Regan, Society of Exploration Geophysicists.

Vincent, R.K., 1975, The Potential Role of Thermal Infrared Multispectral Scanners in Geological Remote Sensing (Invited Paper), Proceedings of the IEEE, Vol. 63, pp. 137-147.

Vincent, R.K., 1973, A Thermal Infrared Ratio Imaging Method for Mapping Compositional Variations Among Silicate Rock Types, Ph.D. Dissertation, Department of Geology and Mineralogy, University of Michigan, Ann Arbor, Michigan.

Vincent, R.K., 1972, An ERTS Multispectral Scanner Experiment for Mapping Iron Compounds, Proceedings of the Eighth International Symposium on Remote Sensing of Environment, Ann Arbor, MI, Vol. 2, pp. 1239-1247, also reprinted in Geophysics Reprint Series No. 3: Remote Sensing, 1983, edited by K. Watson and R.D. Regan, Society of Exploration Geophysicists.

Vincent, R.K., 1972, Emission Polarization Study on Quartz and Calcite, Applied Optics, Vol. 11, pp. 1942-1945. Vincent, R.K., and F. Thomson, 1972, Spectral Compositional Imaging of Silicate Rocks, Jour. of Geophys. Res., Vol. 77, pp. 2465-2471.

Vincent, R.K., F. Thomson, and K. Watson, 1972, Recognition of Exposed Quartz Sand and Sandstone by Two-channel Infrared Imagery, Jour. of Geophys. Res., Vol. 77, pp. 2473-2477, later reprinted in Geophysics Reprint Series No. 3: Remote Sensing, 1983, edited by K. Watson and R.D. Regan, Society of Exploration Geophysicists.

Vincent, R.K., and F. Thomson, 1972, Rock Type Discrimination from Ratioed Infrared Scanner Images of Pisgah Crater, California, Science, Vol. 175, pp. 986-988, later reprinted in Geophysics Reprint Series No. 3.

Salisbury, J.W., R.K. Vincent, L.M. Logan, and G.R. Hunt, 1970, Infrared Emissivity of Lunar Surface Features: Part II. Interpretation, Jour. of Geophys. Res., Vol. 75, pp. 2671-2682.

Hunt, G.R., J.W. Salisbury, and R.K. Vincent, 1969, Lunar Thermal Anomalies and Internal Heating, Astrophysics and Space Science, Vol. 4, pp. 370-372.

Bibliography of Lunar-Planetary Research - First Quarter, 1969, J.E. Adler, S.R. Balsamo, J.P. Dybwad, G.R. Hunt, L.M. Logan, J.S. Salisbury, R.K. Vincent and K.P. Zinnow, Icarus, v. 11, pp. 118-138, 1969.

Hunt, G.R., J.W. Salisbury, and R.K. Vincent, 1968, Lunar Eclipse: Infrared Images and an Anomaly of Possible Internal Origin, Science, Vol. 162, pp. 252-254.

Hunt, G.R., and R.K. Vincent, 1968, The Behavior of Spectral Features in the Infrared Emission from Particulate Surfaces of Various Grain Sizes, Jour. of Geophys. Res., Vol. 73, pp. 6039-6046.

Hunt, G.R., and R.K. Vincent, 1968, Modification to the Perkin-Elmer Reflectance Attachment for Studying Powders, Journal of Scientific Instruments, Vol. 1, pp. 470-471.

Vincent, R.K., and G.R. Hunt, 1968, Infrared Reflectance from Mat Surfaces, Applied Optics, Vol. 7, pp. 53-59.

Refereed Articles-Proceedings Prior to 1993

Torres, V., R.K. Vincent, and P.J. Etzler, 1989, Integrated Mineral Exploration in Northern Mexico Using LANDSAT, Aerial Photography and Ground Work, Proc. of the International Symposium on Remote Sensing of the Environment, Seventh Thematic Conference, Remote Sensing for Exploration Geology, Calgary, Alberta, Canada, pp. 1227-1237.

Vincent, R.K., W.T. Lehman, R.L. Henry, J.D. Herman, M.E. Stivers, M.L. Wilson, and P.J. Etzler, 1988, The Application of High Resolution Digital Elevation Models to Petroleum and Mineral Exploration and Production, Proceedings of the International Symposium on Remote Sensing of the Environment, Sixth Thematic Conference, Remote Sensing for Exploration Geology, Houston, Texas, pp. 293-301.

Vincent, R.K., and D.L. Solomon, 1987, Future Application of Passive Machine Stereo Vision to Obstacle Warning/Avoidance in the Transportation Industry, SAE/ESD International Computer Graphics Conference Proceedings, Detroit, Michigan, April 7-9, 1987, P-196, pp. 231-236.

Herman, J.D., P.J. Etzler, M.L. Wilson, and R.K. Vincent, 1985, The Mid-Continent Rift Frontier Hydrocarbon Play: A Case Study Based Upon an Economical Approach to Prospect Generation, Proceedings of the International Symposium on Remote Sensing of the Environment, Fourth Thematic Conference, Remote Sensing for Exploration Geol., San Francisco, CA, Vol. 1, pp. 21-30.

Vincent, R.K., P.K. Pleitner, D.H. Coupland, H. Schultz, and E.R.B. Oshel, 1984, New Digital Elevation Mapping Software applied to SPOT Simulation Stereo Data, 1984 SPOT Symposium Proceedings, Scottsdale, Arizona, May 20-23, pp. 92-97.

Vincent, R.K., P.K. Pleitner, and M.L. Wilson, 1984, Integration of Airborne Thematic Mapper and Thermal Infrared Multispectral Scanner Data for Lithologic and Hydrothermal Alteration Mapping, Proceedings of the International Symposium on Remote Sensing of the Environment, Third Thematic Conference, Remote Sensing for Exploration Geology, Colorado Springs, Colorado, Vol. 1, pp. 219-226.

Herman, J.D., R.K. Vincent, and J. Huspeni, 1982, LANDSAT Exploration for Precious Metals and Molybdenum in East-Central Idaho, Proceedings of the International Symposium on Remote Sensing of the Environment, Second Thematic Conference, Remote Sensing for Exploration Geology, Fort Worth, Texas, pp. 965-974.

Coupland, D.H. and R.K. Vincent, 1981, Automatic Linear Recognition and Analysis Using Computer Program LIRA, Proceedings of the Fifteenth International Symposium on Remote Sensing of Environment, Ann Arbor, Michigan, Vol. 1, pp. 499-508.

Vincent, R.K., D.H. Coupland, and J.B. Parrish, 1981, HCMM Night-Time Thermal IR Imaging Experiment in Michigan, Proceedings of the Fifteenth International Symposium on Remote Sensing of Environment, Ann Arbor, Michigan, Vol. 2, pp. 975-984.

Vincent, R.K., J. Hartman, A.S. Barrett, D.W. Sammons, 1981, Multispectral Digital Image Anal. of Color-Two-Dimensional Electrophoretograms, Proc. of Electrophoresis '81, Charleston, SC.

Sammons, D.W., R.K. Vincent, R.A. Mitchell, J. Hartman, L.D. Adams, 1981, Qualitative Multispectral Analysis of Color Two-Dimensional Electrophoresis: Applications to Liver Changes in Reye's Syndrome, Proceedings of Clinical Applications and Developments in Two Dimensional Electrophoresis, Rochester, Minnesota, 1981.

Vincent, R.K. and D.H. Coupland, 1980, Petroleum Exploration with LANDSAT in Bay County, Michigan: An Interim Case Study, Proceedings of the Fourteenth International Symposium on Remote Sensing of Environment, San Jose, Costa Rica, Vol. 1, pp. 379-387.

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