

## References

- Abbott E (1990) Proceedings of the second Thermal Infrared Multispectral Scanner (TIMS) workshop: Jet Propulsion Laboratory Publ 90-56, Pasadena, CA
- Abbott, E (1991) Proceedings of the third Thermal Infrared Multispectral Scanner (TIMS) workshop: Jet Propulsion Laboratory Publ 91-29, Pasadena, CA
- Abrams MJ, Brown D (1985) Silver Bell, Arizona, porphyry copper test site. The joint NASA/Geosat test case study, section 4, Am Assoc Petrol Geol, Tulsa, Oklahoma
- Abrams MJ, Ashley RP, Rowan LC, Goetz AFH, Kahle AB (1977) Mapping of hydrothermal alteration in the Cuprite Mining District, Nevada, using aircraft scanner images for the spectral region 0.46 to 2.36  $\mu\text{m}$ . *Geology* 5:713-718
- Abrams MJ, Brown D, Lepley L, Sadowski R (1983) Remote sensing for porphyry copper deposits in south Arizona. *Econ Geol* 78:591-604
- Abrams MJ, Kahle AB, Palluconi FD, Schieldge Jp (1984) Geologic mapping using thermal images. *Remote Sens Environ* 16:13-33
- Abrams MJ, Conel JE, Lang HR (1985) The joint NASA/Geosat test case study. Am Assoc Petrol Geol, Tulsa, Oklahoma
- Adams JB, Smith MO (1986) Spectral mixture modeling: a new analysis of rock and soil types at the Viking Lander I site. *J Geophys Res* 91(B8): 8098-8112
- Addington JD (1975) A hybrid maximum likelihood classifier using the parallelepiped and Bayesian techniques. Technical Papers, 50<sup>th</sup> Annu Meet, Am Soc Photogramm, pp 772-784
- Agar RA, Villanueva R (1997) Satellite, airborne and ground spectral data applied to mineral exploration in Peru. Proc 12<sup>th</sup> Int Conf App Geol Remote Sens, Vol I, Env Res Inst Michigan, Ann Arbor, Mich, pp 13-20
- Agarwal RP, Misra VN (1994) Application of remote sensing in petroleum exploration – case studies from Northeastern region of India. *Ind J Petrol Geol* 3(2):45-68
- Allen CR (1975) Geological criteria for evaluating seismicity. *Geol Soc Am Bull* 86: 1041-1057
- Allum JAE (1966) Photogeology and regional mapping. Pergamon, Oxford
- Almer A, Raggam J, Strobl D (1996) High precision geocoding of remote sensing data of high relief terrain. In: MF Buchroithner (ed) Proc Int Symp High Mountain Remote Sens Cartography, held at Schladming, Austria, 26-28 Sept 1990, Dresden Univ Tech, Dresden, pp 56-65
- Alparone L, Cappellini V, Mortelli L, Aiazzi B, Baronti S, Carla R (1998) A pyramid-based approach to multisensor image data fusion with preservation of spectral signatures. Future Trends in Remote Sensing, Gudmandsen (ed), pp 419-426
- Anbalagan R (1992) Landslide hazard evaluation and zonation mapping in mountainous terrain. *Eng Geol* 32:269-277
- Arnason K (1988) Geowissenschaftliche Fernerkundung mit Satellitendaten in Island – Möglichkeiten und Grenzen. Doctoralthesis, Ludwig-Maximilians University, Munich
- Aronoff S (1989) geographic Information Systems: A management perception. WDL Publ, Ottawa, 294p

- Arora MK, Mathur S (2001) Multi-source image classification using neural network in a rugged terrain. *Geo Carto Int* 16(3):37-44
- Avery TE, Berlin GL (1985) Interpretation of aerial photographs, 4<sup>th</sup> edn Burgess, Minneapolis, Minn
- Baker VR (1986) Fluvial landforms. In: Short NM, Blair RW Jr (eds) *Geomorphology from space*. NASA SP-486, US Govt Printing Office, Washington DC, pp 255-316
- Barringer AR (1976) Airborne geophysical and miscellaneous systems. In: Lintz J Jr Simonett DS (eds) *Remote sensing of environment*. Addison-Wesley, Reading, pp 291-321
- Barzegar F (1983) Earth resources remote sensing platforms. *Photogramm Eng Remote Sens* 49:1669
- Batchelor GB (1974) Practical approach to pattern classification. Plenum, London
- Batson RM, Edwards K, Eliason EM (1976) Synthetic stereographic and Landsat pictures. *Photogramm Eng Remote Sens* 42:1279-1284
- Baugh WM, Kruse FA (1994) Quantitative geochemical mapping of ammonium minerals using field and airborne spectrometers, Cedar Mountains, Esmeralda County, Nevada. Proc 10<sup>th</sup> Thematic Conf Geol Remote Sens, Vol II, Env Res Inst Michigan, Ann Arbor, Mich, pp 304-315
- Becker F, Li ZL (1995) Surface temperature and emissivity at various scales – definition, measurement, and related problems. *Remote Sens Rev* 12:225-253
- Belcher DJ (1960) Photointerpretation in engineering. In: Colwell RN (ed) *Manual of photographic interpretation*. Am Soc Photogramm, Falls Church, VA, pp 403-456
- Bell R, Singhroy VH, Evans CS, Harrington SE (1989) Geologic lithologic mapping in NW Ontario: remote sensing approaches and caveats. Proc 7<sup>th</sup> Thematic Conf Remote Sens Explor Geol, Vol II, Env Res Inst Michigan, Ann Arbor, Mich, pp 819-831
- Berger Z (1992) Geologic stereo mapping of geologic structures with SPOT satellite data. *Am Assoc Pet Geol Bull* 76(1):101-120
- Berger Z (1994) *Satellite Hydrocarbon Exploration and Integration Techniques*. Springer Verlag, New York, 319p
- Berk A, Bernstein LS, Robertson DC (1989) MODTRAN: A moderate resolution model for LOWTRAN7. Tech Rep GL-TR-89-0122, Geophysics Laboratory, Bedford, Mass
- Berlin GL, Schaber GG, Horstman KC (1980) Possible fault detection in Cottonball Basin, California: an application of radar remote sensing. *Remote Sens Environ* 10:33-42
- Bernard R, Taconet O, Vidal-Madjar D, Thony JL, Vauclin M, Chapoton A, Wattrelot F, Lebrun A (1984) Comparison of three in-situ surface soil moisture measurements and application to C-band scatterometer calibration. *IEEE Trans Geosc Remote Sens GE-22(4)*:388-394
- Bernstein R (1976) Digital image processing of earth observation sensor data. *IBM J Res Develop* 20:40-57
- Beynon JDE, Lamb DR (eds) (1980) *Charge-coupled devices and their applications*. McGraw Hill, London
- Bezdek JC, Ehrlich R, Full W (1984) FCM: The fuzzy c-means clustering algorithm. *Comp Geosci* 10:191-203
- Bharkya DK, Gupta RP (1981) Regional tectonics and sulphide ore localisation in Delhi-Aravalli belt, Rajasthan, India – use of Landsat imagery. *Adv Space Res* vol 1, Pergamon, London, pp 299-302
- Bharkya DK, Gupta RP (1983) Lineament structures in the Precambrians of Rajasthan as deciphered from Landsat images. *Recent researches in geology*, vol 10, structure and tectonics of Precambrian rocks. Hindustan Publ, New Delhi, pp 186-197

- Bhattacharya A, Reddy S (1994) Underground and surface coal mine fire detection in India's Jharia Coal Field using airborne thermal infrared data. *Asian-Pacific Remote Sens J* 7(1):59-73
- Billings WP (1950) Vegetation and plant growth as affected by chemically altered rocks in the Western Great Basin, *Ecology* 30:62-74
- Biswas SK (1974) Landscape of Kutch: a morpho-tectonic analysis, *Indian J Earth Sci* 1:177-198
- Björnsson S, Arnason K (1988) Strengths and shortcomings in ATM technology as applied to volcanic and geothermal areas in Iceland. Proc 4<sup>th</sup> Int Conf, Spectral Signatures of Objects in Remote Sensing, Aussois, France, ESA-SP287:189-191
- Blom RG, Crippen RE, Elachi C (1984) Detection of subsurface features in SEASAT radar images of Meems Valley, Mojave Desert, California, *Geology*, 12: 346-349
- Blom RG, Schenck LR, Alley RE (1987) What are the best radar wavelengths, incidence angles, and polarization for discrimination among lava flows and sedimentary rocks? a statistical approach. *IEEE Trans Geosci Remote Sens*, GE-25(2):208-212
- Bloom AL (1978) *Geomorphology*. Prentice Hall, Englewood Cliffs, NJ, p 510
- Bloom AL (1986) Coastal landforms. In: Short NM, Blair RW Jr (eds) *Geomorphology from space*. NASA SP-486 US Govt Printing Office, Washington DC, pp353-406
- Bobba AG, Bukata RP, Jerome JH (1992) Digitally processed satellite data as a tool in detecting potential groundwater flow systems. *J Hydrol* 131:25-62
- Bodechtel J, Zilger J (1996) MOMS – history, concepts, goals. Proc MOMS-02 Symp, Cologne, Germany, 5-7 July 1995. Paris: Euro Assoc Remote Sens Lab (EARSeL): 12-25
- Bodechtel J, Kley M, Münzer U (1985) Tectonic analysis of typical fold structures in the Zagros Mountains, Iran, by the application of quantitative photogrammetric methods on Metric Camera data. Proc DFVLR-ESA Workshop Oberpfaffenhofen, ESA SP-209: 193-197
- Bodechtel J, Haydn R, Zilger J, Meissner D, Seige P, Winkenbach H (1985) MOMS-01: missions and results. In: Schnapf A (ed) *Monitoring earth's oceans, land and atmosphere from space*. Am Inst Aeronautics Astronautics, New York, pp 524-535
- Boerner WM et al. (1998) Polarimetry in radar remote sensing: basic and applied concepts. *Principles and Applications of Imaging Radar. Manual of Remote Sensing*, 3<sup>rd</sup> edn, Vol 2, Wiley, New York, pp 271-357
- Bonham-Carter GF (1994) *Geographic information systems for geoscientists*. Pergamon, Oxford
- Bonham-Carter GF, Agterberg FP, Wright DF (1988) Integration of geological datasets for gold exploration in Nova Scotia. *Photogramm Eng Remote Sens* 54:1585-1592
- Bonn FJ (1977) Ground truth measurements for thermal infrared remote sensing. *Photogramm Engg Remote Sens* 43: 1001-1007
- Bowers TL, Rowan LC (1996) Remote mineralogic and lithologic mapping of the Ice river alkaline complex, British Columbia, Canada, using AVIRIS data. *Photogramm Eng Remote Sens* 62(12):1379-1385
- Brady M (1982) Computational approaches to image understanding. *Association Computer Manufacturers' (ACM) Computing Surveys* 14:3-71
- Brainard J, Lovett A, Parfitt J (1996) Assessing hazardous waste transport risks using a GIS. *Int J Geog Inform Sys* 10:831-849
- Braithwaite JGN (1966) Dispersive multispectral scanning: a feasibility study, final report. Inst Sci Tech Contract No 14-08-001-10053, Univ Mich, Ann Arbor
- Braithwaite JGN, Lowe DS (1966) A spectrum matching technique for enhancing image contrast. *Appl Opt* 5:893-906

- Briole P, Massonnet D, Delacourt C (1997) Post-Eruptive deformation associated with the 1986-87 and 1989 lava flows of Etna, detected by radar interferometry. *Geophys Res Lett* 24:37-40
- Bristow Q (1979) Gamma ray spectrometric methods in uranium exploration airborne instrumentation. In: Hood PJ (ed) *Geophysics and geochemistry in the search for metallic areas*. Geol Surv Can, Econ Geol Report 31:135-146
- Brooks RR (1972) *Geobotany and biogeochemistry in mineral exploration*. Harper and Row, New York, 290 pp
- Bruzewicz AJ (1994) Remote sensing and GIS for emergency management. Proc 1<sup>st</sup> Federal Geographic Tech Conf. Washington DC, GIS World Inc 1:161-164
- Buchanan MD (1979) Effective utilization of colour in multidimensional data presentation. *Proc Soc Photo Opt Instrument Eng* 199:9-19
- Buchanan MD, Pendgrass R (1980) Digital image processing: can intensity hue and saturation replace red, green and blue? *Electro-Optical Systems Design* 12(3):29-36
- Buchroithner MF, Granica K (1997) Applications of imaging radar in hydro-geological disaster management – a review. *Remote Sens Rev* 16:1-134
- Buergmann R et al. (2000) Earthquake potential along the northern Hayward fault, California. *Science*, 18 Aug., 2000, 289(5482):1178-1182
- Burns KL, Brown GH (1978) The human perception of geological lineaments and other discrete features in remote sensing imagery: signal strength, noise levels and quality. *Remote Sens Environ* 7:163-167
- Burns KL, Shepherd J, Berman M (1976) Reproducibility of geological lineaments and other discrete features interpreted from imagery: measurement by a coefficient of association. *Remote Sens Environ* 5:267-301
- Burrough PA (1986) *Principles of geographical information systems for land resources assessment*. Oxford, Clarendon Press
- Byrne GF, Davis JR (1980) Thermal inertia, thermal admittance and the effect of layers. *Remote Sens Environ* 9:295-300
- Byrne GF, Crapper PF, Mayo KK (1980) Monitoring land-cover change by principal component analysis of multitemporal Landsat data. *Remote Sens Environ* 10:175-189
- Campbell AN, Hollister VF, Dutta RV, Hart PE (1982) Recognition of a hidden mineral deposit by an artificial intelligence program. *Science* 217(4563):927-928
- Campbell JB (1996) *Introduction to Remote Sensing*. 2<sup>nd</sup> ed, Guildford, New York, pp 399-409
- Campbell NA (1996) The decorrelation stretch transform. *Int J Remote Sens*, 17:1939-1949
- Carlsaw HS, Jaegar JC (1959) *Conduction of heat in solids*, 2<sup>nd</sup> edn, Oxford Univ Press New York
- Carper WJ, Lillesand TM, Kiefer RW (1990) The use of Intensity Hue-Saturation Transformations for Merging SPOT Panchromatic and Multispectral Image Data. *Photogramm Eng Remote Sens* 56(4):459-467
- Castleman KR (1977) *Digital image processing*. Prentice-Hall, Englewood Cliffs, NJ
- Catlow DR, Parsall RJ, Wytt BK (1984) The integrated use of digital cartographic data and remotely sensed imagery. Proc integrated approaches in remote sensing, Guildford, UK ESA-SP-214, pp 41-66
- Chander R (1989) Southern limits of major earthquake ruptures along the Himalaya between longitudes 75° and 90° E. *Tectonophysics* 170: 115-123
- Chang SH, Collins W (1983) Confirmation of the airborne biogeophysical mineral exploration technique using laboratory methods. *Econ Geol* 78:723-736

- Chattopadhyay N, Hashimi S (1984) The Sung Valley alkaline-ultramafic-carbonatite Complex, East Kasi and Jaintia Hills Districts, Meghalaya. *Rec Geol Surv Ind* 113 (IV): 24-33
- Chavez PS Jr (1988) An improved dark object subtraction technique for atmospheric scattering correction of multispectral data. *Remote Sens Environ* 24: 459-479
- Chavez PS Jr (1996) Image-based atmospheric corrections revisited and improved. *Photogramm Eng Remote Sens* 62:1025-1036
- Chavez PS Jr, Kwarteng AY (1989) Extracting spectral contrast in Landsat Thematic Mapper image data using selective principal component analysis. *Photogramm Eng Remote Sens* 55:339-348
- Chen WP, Molnar P (1977) Seismic moments of major earthquakes and average rates of slip in central Asia. *J Geophys Res* 82:2945-2968
- Chhikara RS (1984) Effect of mixed pixels on crop proportion estimation. *Remote Sens Environ* 14:207-218
- Chiu HY, Collins W (1978) A spectroradiometer for airborne remote sensing. *Photogramm Eng Remote Sens* 44: 507-517
- Christensen PR (1986) A study of filter selection for the thematic mapper thermal infrared enhancement. Commercial applications and scientific research requirements for thermal infrared observations of terrestrial surfaces, NASA-EOSAT Joint Report, pp 105-114
- Civco DL (1989) Topographic normalization of Landsat Thematic Mapper digital imagery. *Photogram Eng Remote Sens* 55(9):1303-1309
- Clark RN (1999) Spectroscopy of rocks and minerals, and principles of spectroscopy. In: Rencz AN (ed) *Remote Sensing for the Earth Sciences, Manual of Remote Sensing*, 3rd edn, vol 3, Am Soc Photogramm Remote Sens, John Wiley, pp 3-58
- Clark RN, Roush TL (1984) Reflectance spectroscopy: quantitative analysis techniques for remote sensing applications. *J Geophys Res* 89(B7): 6329-6340
- Clark RN, Swayze GA (1995) Automated spectral analysis: mapping minerals, amorphous materials, environmental materials, vegetation, water, ice and snow, and other materials: the USGS tricorder algorithm (abstract), *Lunar and Planetary Science XXVI*, pp 255-256
- Clark RN, Swayze GA (1996) Evolution in Imaging Spectroscopy Analysis and Srus or Signal to Noni: An examination of knows flow we have come. Summaries, 6th Annual JPL Airborne Earth Science Workshop, March 4-8, 1996 <http://speclab.cr.usgs.gov>
- Clark RN, King TVV, Klejwa M, Swayze G, Vergo N (1990a) High spectral resolution reflectance spectroscopy of minerals. *J Geophys Res* 95:12653-12680
- Clark RN, Gallagher AJ, Swayze GA (1990b) Material absorption band depth mapping of imaging spectrometer data using complete band shape least-squares fit with library reference spectra. Proc 2<sup>nd</sup> Airborne Visible/Infrared Imaging Spectrometer (AVIRIS) Workshop, JPL Publ 90-54, Jet propulsion Laboratory, California Inst Tech, Pasadena, CA, pp 176-186
- Colby JD (1991) Topographic normalization in rugged terrain. *Photogramm Eng Remote Sens* 57(5):531-537
- Coleman JM, Roberts HH, Huh OK (1986) Deltaic landforms. In: Short NM, Blair RW Jr (eds) *Geomorphology from space NASA-SP-486*, US Govt Printing Office, Washington, DC, pp317-352
- Collins W, Chang SH, Kuo JT (1981) Detection of hidden mineral deposits by airborne spectral analysis of forest canopies. NASA Contract NSG-5222, Final Rep, p 61
- Collins W, Chang SH, Raines G, Channey F, Ashley R (1983) Airborne biogeochemical mapping of hidden mineral deposits, *Econ Geol* 78:737-749
- Colvocoresses AP (1979) Multispectral linear array as an alternative to Landsat-D. *Photogramm Eng Remote Sens* 45:67-69

- Colwell RN (ed) (1960) Manual of photographic interpretation. Am Soc Photogramm, Falls Church, VA
- Colwell RN (1976) The visible portion of the spectrum. In: Lintz J Jr, Simonett DS (eds) Remote sensing of environment. Addison-Wesley, Reading, pp 134-154
- Colwell RN (ed) (1983) Manual of remote sensing, vols I, II, 2<sup>nd</sup> edn. Am Soc Photogramm, Falls Church, VA
- Condit CD, Chavez PS (1979) Basic concepts of computerised digital image processing for geologists. US Geol Surv Bull No. 1462, US Govt Printing Office, Washington DC, 16 pp
- Conel JE, Alley RE (1985) Lisbon Valley, Utah, uranium test case report. The joint NASA/Geosat test case study, section 8, Am Assoc Petrol Geol, Tulsa, Oklahoma
- Congalton RG (1991) A review of assessing the accuracy of classifications of remotely sensed data. *Remote Sens Environ* 37:35-46
- Conradsen K, Harporth O (1984) Use of Landsat multispectral scanner data for detection and reconnaissance mapping of iron oxide staining in mineral exploration, Central East Greenland. *Econ Geol* 79: 1229-1244
- Conradsen K, Nilsson G (1984) Application of integrated Landsat, geochemical and geo-physical data in mineral exploration. Int Symp Remote Sens Environ, 3<sup>rd</sup> Thematic Conf Remote Sens Explor Geol Ann Arbor, MI, pp 499-511
- Couloigner I, Ranchin T, Valtonen VP, Wald L (1998) Benefit of the future SPOT 5 and of data fusion to urban roads mapping. *Int J Remote Sens* 19(8):1519-1532
- Coulson S (1993) SAR interferometry with ERS-1. ESA-publ, Earth Observation Quarterly, No 40, April 1993, pp 20-23
- Cox D, Singer DA (eds) (1986) Mineral Deposit Models. USGS Bull 1693, U S Geol Surv, Washington D C
- Cracknell AP (1998) Review Article: Synergy in remote sensing-what's in a pixel? *Int J Remote Sens* 19:2025-2074
- Craig KB (1972) Synthetic aperture SLAR systems and their application for regional resources analysis Conf Earth resources observation and information analysis system in remote sensing of earth resources. Space Inst, Univ Tennessee, Tullahoma, pp 152-178
- Crane RB (1971) Preprocessing techniques to reduce atmospheric and sensor variability in multispectral scanner data. Proc 7<sup>th</sup> Int Symp on Remote Sens of Environ, vol II. Ann Arbor, MI, pp 1345-1355
- Crippen RE (1987) The regression intersection method of adjusting image data for band ratioing. *Int J Remote Sens* 9:767-776
- Crippen RE (1989) Selection of Landsat TM band and band-ratio combination to maximize lithological information in color composite displays. Proc 7<sup>th</sup> Thematic Conf Remote Sens Explor Geol, pp 917-921
- Croft FC, Faust NL, Holcomb DW (1993) Merging of Radar and VIS/IR Imagery. 9<sup>th</sup> Thematic Conf Geol Remote Sens, Pasadena, CA, February 8-11, pp 379-381
- Crosta AP and Moore JM (1989) Enhancement of Landsat Thematic mapper imagery for residual soil mapping in SW Minas Gerais State, Brazil: a prospecting case history in greenstone belt terrain. Proc 17<sup>th</sup> Thematic Conf Remote Sens Explor Geol, pp 1171-1187
- Crowley JK, Hook SJ (1996) Mapping playa evaporite minerals and associated sediments in Death Valley, California, with multispectral thermal images. *J Geophys Res* 99B:643-660
- Cudahy TJ, Connor PM, Hausknecht P, Hook SJ, Huntington JF, Kahle AB, Phillips RN, Whitbourn LB (1994) Airborne CO<sub>2</sub> laser spectrometer and TIMS TIR data for mineral

- mapping in Australia. Proc 7<sup>th</sup> Australian Remote Sens Conf, Melbourne, Victoria, Australia, March 1-4, pp 918-924
- Curran PJ (1985) Principles of remote sensing. Longman, London
- Daily MI (1983) Hue-saturation-intensity split-spectrum processing of Seasat radar imagery. Photogramm Eng Remote Sens 49:349-355
- Dancak C (1979) Temperature calibration of test infrared scanner. Photogramm Eng Remote Sens 45:749-751
- Davis JC (1986) Statistics and data analysis in geology. 3<sup>rd</sup> edn, Wiley, New York, 646 pp
- Davis LS (1975) A survey of edge detection techniques. Computer Graphics Image Processing 4:248-270
- de Azevedo LHA (1971) Radar in the Amazon project Radam. Proc 7<sup>th</sup> Int Symp Remote Sensing of Environ. Ann Arbor, MI, pp 2303-2306
- De Loor GP (1981) The observation of tidal parameters, currents and bathymetry with SLAR imagery of the sea. IEEEJ Oceanic Eng 6:124-129
- Dellwig LF (1969) An evaluation of multifrequency radar imagery of the Pisgah crater area, California. Mod Geol 1:65-73
- Dellwig LF, Moore RK (1966) The geological value of simultaneously produced like-and cross-polarized radar imagery. J Geophy Res 71:3597-3601
- Denniss AM, Harris AJL, Rothery DA, Francis PW, Carlton RW (1998) Satellite observation of the April 1993 eruption of Lascar volcano. Int J Remote Sens 19(5):801-821
- Desio A (1974) Karakorum Mountains, Mesozoic Cenozoic orogenic belts. Geol Soc Spec Publ 4, London, pp 255-266
- Deutsch M, Estes JE (1980) Landsat detection of oil from natural seeps. Photogramm Eng Remote Sens 46:1313-1322
- Dickerhof C, et al. (1999) Mineral Identification and Lithological Mapping on the Island of Naxos (Greece) using DIAS 7915 Hyperspectral Data. EARSeL Advances in Remote Sens 1(1):255-273
- Dixon TH (1995) SAR interferometry and surface change detection. Report of the workshop held in Boulder, Colorado, February 3-4, 1994
- Doimer J, Strahler AH (1983) Ground investigations in support of remote sensing. In: Colwell RN (ed) Manual of remote sensing, 2<sup>nd</sup> edn: ch 23, p969-989. Am Soc Photogramm Remote Sens, Falls Church, VA
- Doyle FJ (1985) The Large Format Camera on shuttle mission 41-G. Photogramm Eng Remote Sens 51:200
- Dozier J, Frew J (1981) Atmospheric corrections to satellite radiometric data over rugged terrain. Remote Sens Environ 11:191-205
- Drury SA (1993) Image interpretation in Geology, 2<sup>nd</sup> edn. London:Allen and Unwin
- Duval JS (1983) Composite color images of aerial gamma-ray spectrometric data. Geophysics 48:722-735
- Eastman Kodak Company (1981) Applied infrared photography. Eastman Kodak publ, Rochester, New York
- Eastman Kodak Company (1990) Handbook of Kodak photographic filters. Eastman Kodak publ, Rochester, New York
- Eastman Kodak Company (1992) Kodak data for aerial photography. Eastman Kodak publ, 6<sup>th</sup> edn, Rochester, New York
- Edwards K, Davis PA (1994) The use of intensity-hue-saturation transformation for producing color shaded-relief images. Photogramm Eng Remote Sens 60:1369-1374
- Ehlers M (1991) Multisensor Image Fusion Techniques in Remote Sensing. ISPRS J Photogramm Remote Sens 4671(1):19-30
- Elachi C (1980) Spaceborne imaging radar: geologic and oceanographic applications. Science 209(4461):1073-1082

- Elachi C (1983) Microwave and infrared satellite remote sensors. In: Colwell RN (ed) Manual of remote sensing. 2<sup>nd</sup> edn, vol 1, Am Soc Photogramm, Falls Church, VA
- Elachi C, Ulaby FT (1990) Radar polarimetry for geoscience applications. Artech House, Norwood, MA, 364 pp
- Elachi C, Brown WE, Cinino JB, Dixon T et al. (1982a) Shuttle imaging radar experiment. Science 218:996-1003
- Elachi C, Roth LE, Schaber GG (1984) Spaceborne radar subsurface imaging in hyperarid regions. IEEE Trans GE-22: 382-387
- Ellyett CD, Fleming A W (1974) Thermal Infrared Imagery of the Burning Mountain Coal Fire. Remote Sens Environ 3(1):79-86
- Ellyett CD, Pratt DA (1975) A review of the potential applications of remote sensing techniques to hydrogeological studies in Australia. Aust Water Res Council Tech Pap No. 13, 147 pp
- Elvidge CD (1982) Affect of vegetation on airborne thematic map imagery of the Kalamazoo propyry copper deposit, Arizona. Int Symp Remote Sens Environ, 2nd Thematic Conf Remote Sens Explor Geol, Fort Worth, Texas, pp 661-667
- EOSAT (1994) Merge process enhances value of data sets. EOSAT Notes, Vol.9, pp 5
- Eppes TA, Rouse JW Jr (1974) Viewing-angle effects in radar images. Photogramm Eng 40:169-173
- Evans DL, Farr TG, Ford JP, Thompson TW, Werner CL (1986) Multipolarization radar images for geologic mapping and vegetation discrimination. IEEE Trans Geosci Remote Sens 24:246-257
- Evans DL, Farr TG, Zebker HA, Mouginis-Mark PJ (1992) Radar interferometry studies of the earth's topography. EOS, Transactions, Am Geophys Union 73, 533:557-558
- Evans DL, Plant JJ, Stofan ER (1997) Overview of the Spaceborne Imaging Radar-C/X-band Synthetic Aperture Radar (SIR-C/X-SAR) missions. Remote Sens Environ 59: 135-140
- Everett JR, Morisawa M, Short NM (1986) Tectonic landform. In: Short NM, Blair RW Jr (eds) Geomorphology from space, NASA SP-486, US Govt Printing Office, Washington D C, pp 27-184
- Fabbri AG (1984) Image processing of geological data. Van Nostrand Reinhold, New York, 244 pp
- Farag AA (1992) Edge-based image segmentation. Remote Sens Rev 6:95-122
- Farmer VC (ed) (1974) The infrared spectra of minerals. Mineralogical Soc Publ, London
- Farr TG (1983) Use of radar image texture in geologic mapping, Proc Symp Spaceborne Imaging Radar. Jet Propul Lab Pasadena, CA, pp 73-75
- Farrand WH, Harsanyi JC (1997) Mapping the distribution of mine tailings in the Coeur d' Alene River valley, Idaho, through the use of a Constrained Energy Minimization Technique. Remote Sens Environ 59:64-76
- Farrand WH, Seelos A (1996) Using mineral maps generated from imaging spectrometer data to map faults: an example from summitville, Colorado. Proc 11<sup>th</sup> Thematic Conf Geol Remote Sens, Vol II, Env Res Inst Michigan, Ann Arbor, Mich, pp 222-230
- Fielding EJ, Blom RG, Goldstein R.M (1997) Detection and monitoring of rapid subsidence over Lost Hills and Belridge oil fields by SAR interferometry. Proc 12<sup>th</sup> Int Conf Workshops Appl Geol Remote Sens, Denver, Colorado, vol I, p 84
- Fischer WA (1975) History of remote sensing. In: Reeves RG(ed) manual of remote sensing. Am Soc Photogramm, Falls Church, VA, pp27-50
- Fisher PF, Pathirana S (1990) The evaluation of fuzzy membership of land cover classes in the suburban zone. Remote Sens Environ 34:121-132

- Foody GM (1992) A fuzzy sets approach to representation of vegetation continua from remotely sensed data: An example from Lowland heath. *Photogramm Eng Remote Sens* 58:221-225
- Foody GM (1995) Land cover classification by an artificial neural network with ancillary information. *Int J Geog Inform Sys* 9:527-542
- Foody GM, Arora MK (1996) Incorporating Mixed Pixels in the Training, Allocation and Testing Stages of Supervised Classifications. *Pattern Recog Lett* 17:1389-1398
- Foody GM, Arora MK (1997) An Evaluation of Some Factors Affecting the Accuracy of Classification by an Artificial Neural Network. *Int J Remote Sens* 18(4):799-810
- Fookes PG, Sweeney M, Manby CND, Martin RP (1985) Geological and geotechnical engineering aspects of low-cost roads in mountainous terrain. *Eng Geol* 21:1-152
- Ford JP (1982) Resolution versus speckle relative to geologic interpretability of spaceborne radar images – a survey of user preferences. *IEEE Trans Geosci and Remote Sens GE-20 (4)*: 434-444
- Ford JP (1998) Radar Geology. In: Henderson FM, Lewis AJ (eds) *Principles and Applications of Imaging Radar*. Manual of Remote Sensing, 3<sup>rd</sup> edn, Vol 2, Wiley, New York, pp 511- 565
- Ford JP, Cimino JB, Elachi C (1983) Space shuttle Columbia views the world with imaging radar: the SIR-A experiment. *Jet Propul Lab Publ No 82-95*, Pasadena, CA, 179pp
- Ford JP, Cimino JB, Holt B, Ruzek MR (1986) Shuttle imaging radar views the Earth from Challenger: the SIR-B experiment. *Jet Propul Lab Publ No 86-10*, Pasadena, CA, 135pp
- Franceschetti G, Lanari R (1999) *Synthetic Aperture Radar Processing*. CRC Press, Boca Raton, Florida, p 307
- Francis PW, De Silva SL (1989) Application of the Landsat Thematic Mapper to the identification of potentially active volcanoes in the Central Andes. *Remote Sens Environ* 28:245-255
- Francis PW, Rothery DA (1987) Using the Landsat Thematic Mapper to detect and monitor active volcanoes: an example from Lascar volcano, northern Chile. *Geology* 15:614-617
- Franklin SE (1994) Discrimination of subalpine forest species and canopy density using digital CASI, SPOT PLA and Landsat TM data. *Photogramm Eng Remote Sens* 60:1233-1241
- Fraser RS, Curran RJ (1976) Effects of the atmosphere on remote sensing. In: Lintz J Jr, Simonett DS (eds) *Remote sensing of environment*. Addison-Wesley, Reading, pp 34-84
- Fraser SJ (1991) Discrimination and identification of ferric oxides using satellite Thematic Mapper data: A Newman case study. *Int J Remote Sens* 12(3):635-641
- Fraser SJ, Green AA (1987) A software defoliant for geological analysis of band ratios. *Int J Remote Sens* 8:525-532
- Gabriel AK, Goldstein RM (1988) Crossed orbit interferometry. Theory and experimental results from SIR-B. *Int J Remote Sens* 9:857-872
- Gabriel AK, Goldstein RM, Zebker HA (1989) Mapping small elevation changes over large areas. Differential radar interferometry. *J Geophys Res* 94(B7):9183-9191
- Gangopadhyay PK (1967) Structural framework of Alwar region with special reference to the occurrence of some rock types. *Proc Symp Upper Mantle Project, Nat Geophys Res Inst, Hyderabad*, pp 420-429
- Gansser A (1968) The Insubric Line – a major geotectonic problem. *Schweiz Mineral Petrol Mitt* 48:123-143
- Gates DM (1970) Physical and physiological properties of plants. In: *Remote sensing with special reference to agriculture and forestry*. Nat Acad Sci, Washington, DC, pp 224-252

- Gausmann HW, Escobar DE, Everitt JH, Richardson AJ, Rodriguez RR (1978) Distinguishing succulent plants from crop and woody plants. Photogramm Eng Remote Sens 44:487-491
- Gausmann HW, Escobar DE, Knippling EB (1977) Relation of *Peperomia obtusifolia*'s anomalous leaf reflectance to its leaf anatomy. Photogramm Eng Remote Sens 43:1183-1185
- Genderen JLvan, Haiyan G (1997) Environmental monitoring of spontaneous combustion in the North China Colafields. ITC Enschede, 244 pp
- Genderen JLvan, Cassells CJS, Zhang XM (1996) The synergistic use of remote sensed data for the detection of underground coal fires. Int Archivs Photogramm Remote Sens, vol xxxi, part 7, Viena, 9-19, July 1996
- Gens R (1998) Quality Assessment of SAR Interferometric Data. ITC Publication No 61, pp 141
- Gens R, Genderen JLvan (1996) SAR interferometry – issues, techniques, applications. Int J Remote Sens 17:1803-1835
- Ghiglia DC, Pritt MD (1998) Two-dimensional phase unwrapping: theory, algorithms and software. Wiley Interscience, 493p
- Gillespie AR (1980) Digital techniques of image enhancement. In: Siegal BS, Gillespie AR (eds) Remote sensing in geology, Wiley, New York, pp 139-226
- Gillespie AR (1992) Enhancements of multispectral thermal infrared images: de-correlation contrast stretching, Remote Sens Environ 42:147-156
- Gillespie AR, Kahle AB (1977) Construction and interpretation of a digital thermal inertia image. Photogramm Eng Remote Sens 43:983-1000
- Gillespie AR, Kahle AB, Palluconi FD (1984) Mapping alluvial fans in Death Valley, California using multichannel thermal infrared images. Geophys Res Lett 11:1153-1156
- Gillespie AR, Kahle AB Walker RE (1986) Color enhancement of highly correlated images: I-decorrelation and HIS contrast stretches, Remote Sens Environ 20:209-235
- Gillespie AR, Kahle AB, Walker RE (1987) Colour enhancement of highly correlated images:II-Channel ratio and chromaticity transformation techniques, Remote Sens Environ 22:343-365
- Glaze LS, Francis PW, Self S, Rothery DA (1989) The 16 September 1986 eruption of Lascar volcano, north Chile: satellite investigations Bull. Volcanology 51P:146-160
- Glikson AY, Creasey JW (1995) Application of Landsat-5 TM imagery to mapping of the Giles Complex and associated granulites, Tomkinson Ranges, western Musgates Block, central Australia. J Aust Geol Geophy 16:173-193
- Goetz AFH (1980) Stereosat: a global digital stereo imaging mission. Int archieves of photogrammetry, pt B9 XIV Congress, Hamburg, pp 563-570
- Goetz AFH, Rowan LC (1981) Geologic remote sensing. Science 211:781-791
- Goetz AFH, Srivastava V (1985) Mineralogic mapping in the Cuprite mining district, Nevada. Proc Airborne Imaging Spectrometer Data Analysis Workshop. JPL Publ 85-41, Jet Propulsion Laboratory, Pasadena, CA, pp 22-31
- Goetz AFH, Rowan LC, Kingston MJ (1982) Mineral identification from orbit: initial result from the Shuttle Multispectral Infrared Radiometer. Science 218:1020-1024
- Goetz AFH, Rock BN, Rowan LC (1983) Remote sensing for exploration: an overview. Econ Geol 79:573-590
- Gold DP (1980) Structural geology. In: Siegal BS, Gillespie AR (eds) Remote sensing in geology. Wiley, New York, pp 419-483
- Goldstein RM, Barnett TP, Zebker HA (1989) Remote sensing of ocean currents. Science 246:1282-1285

- Goldstein RM, Engelhardt H, Kamb B, Frolich RM (1993) Satellite radar interferometry for monitoring ice sheet motion. Application to an Antarctic ice stream. *Science* 262:1525-1530
- Gong P (1996) Integrated analysis of spatial data for multiple sources: using evidential reasoning and artificial neural network techniques for geological mapping. *Photogramm Eng Remote Sens* 62:513-523
- Gonzales RC, Woods RE (1992) Digital Image Processing. Addison-Wesley, Reading
- Goosens MA (1991) Integration of remote sensing data and ground data as an aid to exploration for granite related mineralization, Salamanca province, W-Spain. Proc 8<sup>th</sup> Int Conf Geol Remote Sens, Vol I, Environ Res Inst Mich, Ann Arbor, Mich, pp 393-406
- Graham LC (1974) Synthetic interferometer radar for topographic mapping. Proc IEEE 62:763-768
- Green AA, Berman M, Switzer P, Graig MD (1988) A transformation for ordering multispectral data in terms of image quality with implications for noise removal. *IEEE Trans Geosci Remote Sens* 26:65-74
- Green RO (1992) Determination of the in-flight spectral and radiometric characteristics of the Airborne Visible/Infrared Imaging Spectrometer (AVIRIS). In: Toselli F, Bodechtel J (eds) Imaging Spectrometry: Fundamentals and Prospective Applications. Kluwer, Dordrecht:103-123
- Guilbert JM, Park CF Jr (1986) The geology of ore deposits. Freeman, New York, 985pp
- Guild PW (1972) Metallogeny and the new global tectonics. Proc 24<sup>th</sup> Int Geol Cong Sect 4, mineral deposits, pp 17-24
- Gupta RP (1977a) Delineation of active faulting and some tectonic interpretations in Munich-Milan section of eastern Alps-use of Landsat imagery. *Tectonophysics* 38:297-315
- Gupta RP (1977b) Neue geologische Strukturen in Himalaja entdeckt, Umschau 77:329-330
- Gupta RP (1991) Remote sensing geology. 1<sup>st</sup> edn, Springer-Verlag, Heidelberg, pp 356
- Gupta RP, Bharktya DK (1982) Post-Precambrian tectonism in the Delhi-Aravalli belt, Precambrian Indian Shield-evidences from Landsat images. *Tectonophysics* 85:T9-T19
- Gupta RP, Bodechtel J (1982) Geotechnical applications of Landsat image analysis of Bhakra dam reservoir, India. *Remote Sens Environ* 12:3-13
- Gupta RP, Joshi BC (1990) Landslide hazard zoning using the GIS approach – a case study from the Ramganga Catchment, Himalayas. *Eng Geol* 28:119-131
- Gupta RP, Prakash A (1998) Reflectance aureoles associated with thermal anomalies due to subsurface mine fires in the Jharia cauldron, India. *Int J Remote Sens* (under publication)
- Gupta RP, Saha AK (2000) Mapping debris flows in the Himalayas. *GIS@Development*, IV(12):26-27 <http://www.gis-development.net>
- Gupta RP, Sen AK (1988) Imprints of the Ninety-East Ridge in the Shillong Plateau, Indian Shield. *Tectonophysics* 154:335-341
- Gupta RP, Saraf AK, Chander R (1998) Discrimination of areas susceptible to earthquake induced liquefaction from Landsat data. *Int J Remote Sens* 19(4):569-572
- Gupta RP, Saha AK, Arora MK, Kumar A (1999) Landslide hazard zonation in a part of the Bhagirathi Valley, Garhwal Himalayas, using integrated remote sensing – GIS. *Himalayan Geol* 20(2):71-85
- Halbouly MT (1976) Application of Landsat imagery to petroleum and mineral exploration. *Am Assoc petrol Geol* 60:745-793
- Halbouly MT (1980) Geologic significance of Landsat data of 15 giant oil and gas fields. *AAPG Bulletin* 64(1):8-36
- Hall DK, Martinec J (1985) Remote Sensing of Ice and Snow. Chapman and Hall, London, 189p

- Halsema D Van, Kooij MWA Van der, Groenewoud W, Huisng J, Ambrosius BAC Klees R (1995) SAR interferometric in Nederlands. *Remote Sens Nieuwesbrief*, Juni 1995, pp 31-34
- Haralick RM (1979) Statistical and structural approaches to texture. *Proc IEEE* 67:786-804
- Haralick RM, Fu K (1983) Pattern recognition and classification. In: Colwell RN (ed) *Manual of remote sensing*. Am Soc Photogramm Remote Sens, Falls Church, VA, pp 793-805
- Harding AE, Forrest MD (1989) Analysis of multiple geological data sets from English Lake District. *IEEE Trans Geosci Remote Sens* 27:732-739
- Harris PM, Ventura SJ (1995) The integration of geographic data with remotely sensed imagery to improve classification in urban area. *Photogramm Eng Remote Sens* 61:993-998
- Harris JR, Murray R, Hirose T (1990) IHS transform for the integration of radar imagery and other remotely sensed data. *Photogramm Eng Remote Sens* 56:1631-1641
- Harris JR, David WV, Andrew NR (1999) Integration and visualization of geoscience data. *Remote Sensing for the Earth Sciences, Manual of Remote Sensing*, 3<sup>rd</sup> ed, Vol 3, Am Soc Photogramm Remote Sens pp 307-354
- Haydn R (1985) A concept for the processing and display of Thematic Mapper data. *Proc Symp Landsat-4 Science Characterization Early Results*, NASA publ 2355 Greenbelt, MD. pp 217-237
- Haydn R, Dalke GW, Henkel J, Bare JE (1982) Application of the IHS colour transform to the processing of multisensor data and image enhancement. *Proc Int Symp Remote Sens of Arid and Semi-Arid Lands*, Cairo, pp 599-616
- Henderson FM, Lewis AJ (eds) (1998) *Principles and Applications of Imaging Radar*. *Manual of Remote Sensing*, 3<sup>rd</sup> edn, Vol 2, Wiley, New York
- Hepner GF, Logan T, Ritter N, Bryant N (1990) Artificial neural network classification using a minimal training set: comparison to conventional supervised classification. *Photogramm Eng Remote Sens* 56:469-473
- Heron AM (1922) Geology of the western Jaipur. *Rec Geol Surv Ind* vol LIV, pp345-397
- Heron AM (1953) The geology of central Rajputana. *Mem Geol Surv Ind* 79:1-389
- Heywood I, Cornelius S, Carver S (1998) *An Introduction to Geographical Information Systems*. Addison Wesley Longman Limited, 279pp
- Hill J (1991) A quantitative approach to remote sensing: sensor calibration and comparison. In Belward AS and Valenzuela CR (eds) (1991):97-110
- Hiller K (1984) MOMS-01 experimental missions on space shuttle flights STS-7 June'83, STS-II Feb.'84-data catalogue. DFVLR, Oberpfaffenhofen
- Hintz A (1999) Large image format aerial cameras: film based systems and digital perspectives. In: Nieuwenhuis, Vaughan and Molenaar (eds), *Operational Remote Sensing for Sustainable Development*, Balkema, Rotterdam, pp 231-236
- Hixson M, Scholz D, Fuchs N, Akiyama T (1980) Evaluation of several schemes for classification of remotely sensed data. *Photogramm Eng Remote Sens* 46:1547-1553
- Hobbs WH (1904) Lineaments of the Atlantic border region. *Geol Soc Am Bull* 15:483-506
- Hodgson R, Cady B, Pairman D (1981) A solid-state airborne sensing system for remote sensing. *Photogramm Eng Remote Sens* 47:177-182
- Hofmann O, Nave P, Ebner H (1984) DPS-a digital photogrammetric system for producing digital elevation models and orthophotos by means of linear array scanner imagery. *Photogramm Eng Remote Sen* 50:1135-1142
- Holasek RE, Rose WI (1991) Anatomy of Augustine volcano eruptions as recorded by multispectral image processing of digital AVHRR weather Satellite. *Bull Volcanology* 53:420-435

- Holben BN, Justice C (1980) An examination of spectral band ratioing to reduce the topographic effect on remotely sensed data. NASA Technical Memorandum 80640, Goddard Space Flight Center, Greenbelt, MD, p28
- Hook SJ, Kahle AB (1996) The micro Fourier transform interferometer ( $\mu$ FTIR): a new field spectrometer for acquisition of infrared data of natural surfaces. *Remote Sens Environ* 56:172-181
- Hook SJ, Gabell AR, Green AA, Kealy PS (1992) A comparison of techniques for extracting for emissivity information from thermal infrared data for geologic studies. *Remote Sens Environ* 42:123-135
- Hook SJ, Abbott EA, Grove C, Kahle AB, Palluconi F (1999) Use of multispectral thermal infrared data in geological studies. In: Rencz AN (ed) *Remote Sensing for the Earth Sciences, Manual of Remote Sensing*, 3rd edn, vol 3, Am Soc Photogramm Remote Sens, John Wiley, pp 59-110
- Hoover G, Kahle AB (1987) A thermal emission spectrometer for field use. *Photogramm EngRemote Sens* 53:627-632,  
<http://southport.jpl.nasa.gov/scienceapps/dixon/index.html>
- Hord RM (1982) *Digital image processing of remotely sensed data*. Academic Press, New York, 256pp
- Horler DNH, Barber J, Barringer AR (1980) Effects of heavy metals on the absorbance and reflectance spectra of plants. *Int J Remote Sens* 1:121-136
- Horler DNH, Dockray M, Barber J, Barringer AR (1983) Red edge measurements for remote sensing plant chlorophyll content. *Proc Symp Remote Sens Mineral Expl Commun on Space Research*, Ottawa
- Howard AD (1967) Drainage analysis in geological interpretation: a summation. *Am Assoc Petrol Geol Bull* 51:2246-2259
- Hsu S (1978) Texture-tone analysis for automated landuse mapping. *Photogramm Eng Remote Sens* 44:1393-1404
- Huang Yongfang, Huang Hai, Chen Wei, Yinxi LI (1991) Remote Sensing Approaches for Zunderground Coal Fire Detection. Presented at the Beijing International Conference on Reducing of Geological Hazards, pp 634-641
- Huguenin RL, Jones JL (1986) Intelligent information extraction from reflectance spectra: absorption band positions. *J Geophy Res* 91:9585-9598
- Hunt GR (1977) Spectral signatures of particulate minerals in the visible and near-infrared. *Geophysics* 42:501-513
- Hunt GR (1979) Near-Infrared (1.3-2.4 $\mu$ m) spectra of alteration minerals potential for use in remote sensing. *Geophysics* 44:1974-1986
- Hunt GR (1980) Electromagnetic radiation: the communication link in remote sensing. In: Siegal BS, Gilleppe AR (eds) *Remote Sensing in geology*. Wiley, New York, pp 5-45
- Huntington JF, Raiche AP (1978) A multi-attribute method for comparing geological lineament interpretations. *Remote Sens Environ* 7: 145-161
- Hutchinson CF (1982) Techniques for combining Landsat and ancillary data for digital classification improvement. *Photogramm Eng Remote Sens* 48:123-130
- Hutsinpiller A (1988) Discrimination of hydrothermal alteration mineral assemblages at Virginia City, Nevada, using the airborne imaging spectrometer. *Remote Sens Environ* 24:53-66
- Ichoku C, Karnieli A (1996) A review of mixture modeling techniques for sub-pixel land cover estimation. *Remote Sens Rev* 13:161-186
- Itten KI, Meyer P (1993) Geometric and radiometric correction of TM data of mountainous forested areas. *IEEE Trans Geosc Remote Sens* 31:764-770
- Jakobsson SP (1979) Petrology of Recent basalts of the eastern volcanic zone, Iceland. *Acta Naturalia Islandica*, No 26, Icelandic Museum of Natural History, Reykjavik

- Janza FJ (1975) Interaction mechanisms. In: Reeves RG (ed) Manual of remote sensing. 1<sup>st</sup> edn, Am Soc Photogramm, Falls Church, VA, pp 75-179
- Jayaweera K, Seifert R, Wendler G (1976) Satellite observations of the eruption of Tolbachik Volcano. *Trans Am Geophys Union* 57: 196-200
- Jensen JR (1986) Introductory digital image processing. Prentice Hall, Englewood Cliffs, New Jersey, 379pp
- Jiang D, Wang P, Meng F (1994) Application of Landsat TM data into exploration for porphyry copper deposits in forested area. In: Proc 10<sup>th</sup> Thematic Conf Geol Remote Sens, Vol II, Environ Res Inst Michigan, Ann Arbor, Mich, pp 611-618
- Johnson PE, Smith MO, Taylor-George S, Adams JB (1983) A semiempirical method for analysis of the reflectance spectra of binary mineral mixtures. *J Geophys Res* 88 (B4): 3557-3561
- Jones RC (1968) How images are detected. *Sci Am* 219:111-117
- Jonsson S, Adam N, Bjornsson H (1998) Effects of geothermal activity observed by satellite radar interferometry. *Geophys Res Lett* 25(7):1059-1062
- Joria PE, Jorgenson JC (1996) Comparison of three methods for mapping Tundra with Landsat digital data. *Photogramm Eng Remote Sens* 62:163-169
- Joseph G (1996) Imaging sensors for remote sensing. *Remote Sens Rev* 13:257-342
- Joughin et al. (1998) Interferometric estimation of three-dimensional ice-flow using ascending and descending passes. *IEEE Trans Geosci Remote Sens* 36(1):25-35
- JPL (Jet Propulsion Laboratory) (1986) Shuttle imaging radar-C science plan. NASA-Jet Propulsion Laboratory, Pasadena, Publ 86-29
- Justice C, Wharton SW, Holben BN (1981) Application of digital terrain data to quantify and reduce the topographic effect on Landsat data. *Int J Remote Sens* 2:213-230
- Kahle AB (1977) A simple thermal model of the Earth's surface for geologic mapping by remote sensing. *J Geophys Res* 82: 1673-1690
- Kahle AB (1980) Surface thermal properties. In: Siegal BS, Gillespie AR (eds) *Remote sensing in geology*. Wiley, New York, pp 257-273
- Kahle AB (1983) The new airborne thermal infrared multispectral scanner (TIMS). *Proc Int Geosci Remote Sens Symp (IGARSS)*, San Francisco, Sect FA-4, pp 7.1-7.3
- Kahle AB, Goetz AFH (1983) Mineralogic information from a new airborne thermal infrared multispectral scanner. *Science* 222:24-27
- Kahle AB, Rowan LC (1980) Evaluation of multispectral middle infrared aircraft images for lithologic mapping in the East Tintic Mountains, Utah. *Geology* 8:234-239
- Kahle AB, Gillespie AR, Goetz AFH (1976) Thermal inertia imaging: a new geologic mapping tool. *Geophys Res Lett* 3:26-28
- Kahle AB, Madura DP, Soha JM (1980) Middle infrared multispectral aircraft scanner data: analysis for geological applications. *Appl Optics* 19:2279-2290
- Kahle AB, Schieldge JP, Alley RE (1984a) Sensitivity of thermal inertia calculations to variations in environmental factors. *Remote Sens Environ* 16:211-232
- Kahle AB, Shumate MS, Nash DB (1984b) Active airborne infrared laser system for identification of surface rock and minerals, *Geophys Res Lett* 11:1149-1152
- Kahle AB, Christensen P, Crawford M, Cuddapah P, Malila W, Palluconi F, Podwysocki M, Salisbury J, Vincent R (1986) Geology panel report. Commercial Applications and Scientific Research Requirements for TIR Observations of Terrestrial Surfaces, EOSAT-NASA Thermal IR Working Group, Aug 1986, pp 17-34
- Kahle AB, Pallucani FD, Hook SJ, Realmuto VJ, Bothwell G (1991) The advanced spaceborne thermal emission and reflectance radiometer (ASTER). *Int J Imaging Systems Tech* 3:144-156

- Kaneko T (1978) Colour composite pictures from principal axis components of multispectral scanner data. *IBM J Res Dev* 22:386-392
- Kaplon ED (ed) (1996) Understanding GPS: Principles and Applications. Artech House Publ, Boston
- Karr C Jr (ed) (1975) Infrared and Raman Spectroscopy of lunar and terrestrial minerals. Academic Press, New York
- Kasischke ES, Schuchman AR, Lyzenga RD, Meadows AG (1983) Detection of bottom features on Seasat synthetic aperture radar imagery. *Photogramm Eng Remote Sens* 49:1341-1353
- Kats YAG, Ryabukhin AG, Trofimov DM (1976) Space methods in geology. Moscow State University, Moscow, 248pp (in Russian)
- Kaufmann HJ (1985) Rechnergestützte methodische Untersuchungen Multispekturaler Satellitenbiddaten (Landsat/HCMM) für geologische Fragestellungen am Beispiel Anti-Atlas, Marokko. PhD Dissertation, Univ Munich
- Kaufmann HJ (1988) Mineral exploration along the Aqaba-Levant structure by use of TM-data-concepts, processing and results. *Int J Remote Sens* 9(10-11):1639-1658
- Kayal JR (1987) Microseismicity and source mechanism study: Shillong Plateau, northeast India. *Bull Seism Soc Am* 77(1): 184-194
- Key JR, Maslanik JA, Barry RG (1989) Cloud classification from satellite data using a fuzzy set algorithm: A polar example. *Int J Remote Sens* 10:1823-1842
- Khazenie N, Richardson KA (1993) Detection of oil fire smoke over water in the Persian Gulf region. *Photogramm Eng Remote Sens* 59:1271-1276
- King DJ (1995) Airborne multispectral digital camera and video sensors: a critical review of system designs and applications. *Canadian J Remote Sens*, Special Issue on Aerial Optical Remote Sensing 21 (3):245-273 web-site: [www.carleton.ca/~dking/papers.html](http://www.carleton.ca/~dking/papers.html)
- Konecny G (1984) The photogrammetric camera experiment on Spacelab 1. *Bildmessung und Luftbildwesen* 52:195-200
- Konecny G, Lohmann P, Engel H, Kruck E (1987) Evaluation of SPOT imagery on analytical photogrammetric instruments. *Photogramm Eng Remote Sens* 53:1223-1230
- Koopmans BN (1983a) Spaceborne imaging radars: present and future. *ITCJ* (1983-3): 223-231
- Kowalik WS, Lyon RJP, Switzer P (1983) The effects of additive radiance terms on ratios of Landsat data. *Photogramm Eng Remote Sens* 49:659-669
- Kozlov VV, Romashov AA, Volchegurskiv L, Vorobeyer VT (1979) Use of satellite photographs to study deep crustal structures of petroliferous regions. Pt-III Lineaments of the Aral-Caspian Region. *Int Geol Rev* 11:1337-1344
- Kreiter VM (1968) Geological prospecting and exploration. Mir, Moscow, 361pp
- Krishnamurthy J, Venkatesa Kumar N, Jayaraman V, Manivel M (1996) An approach to demarcate groundwater potential zones through remote sensing and a geographic information system. *Int J Remote Sens* 17:1867-1884
- Krishnamurthy P (1985) Petrology of the carbonatites and associated rocks of Sung Valley, Jaintia Hills District, Meghalaya, India. *J Geol Soc Ind* 26:361-379
- Krüger G, Erzinger J, Kaufmann H (1998) Laboratory and airborne reflectance spectroscopic analyses of lignite overburden dumps. *J Geochem Explor* 64:47-65
- Kruse FA (1997) Characterization of active hot-springs environments using multispectral and hyperspectral remote sensing. Proc 12<sup>th</sup> Int Conf App Geol Remote Sens, Vol I, Env Res Inst Michigan, Ann Arbor, Mich, pp 214-221
- Kruse FA (1999) Visible Infrared sensors case studies. In: Rencz AN (ed) *Remote Sensing for the Earth Sciences, Manual of Remote Sensing*, 3rd ed, vol 3, Am Soc Photogramm Remote Sens, Wiley, pp 567-611

- Kruse FA, Boardman JW (1997) Characterizing and mapping of kimberlites and related diatremes in Utah, Colorado, and Wyoming, USA, using the Airborne Visible/Infrared Imaging Spectrometer (AVIRIS). Proc 12<sup>th</sup> Int Conf App Geol Remote Sens, Vol I, Env Res Inst Michigan, Ann Arbor, Mich, pp 21-28
- Kruse FA, Lefkoff AB (1993) Knowledge Based Geologic Mapping with Imaging Spectrometers. *Remote Sens Rev* 8:3-28
- Kruse FA, Calvin WM, Seznec O (1988) Automated extraction of absorption features from airborne visible/infrared imaging spectrometer (AVIRIS) and Geophysical Environmental Research imaging spectrometer (GERIS) data. In: Proc AVIRIS Performance Evaluation Workshop, JPL Publ 88-38, Jet Propulsion Laboratory, California Inst Tech, Pasadena, CA, pp 62-75
- Kruse FA, Kierein-Young KS, Boardman JW (1990) Mineral mapping at cuprite, Nevada with a 63-channel Imaging Spectrometer. *Photogramm Eng Remote Sens* 56(1):83-92
- Kruse FA, Lefkoff AB, Boardman JW, Heidebrecht KB, Shapiro AT, Barloon PJ, Goetz AFH (1993) The Spectral Image Processing System (SIPS)-interactive visualization and analysis of imaging spectrometer data. *Remote Sens Environ* 44:145-163
- Labovitz ML, Masuoka EJ, Bell R, Nelson RF, Latsen EA, Hooker LK, Troensegaard KW (1985) Experimental evidence for spring and autumn windows for the detection for geo-botanical anomalies through the remote sensing of overlying vegetation. *Int J Remote Sens* 6:195-216
- Lang HR (1999) Stratigraphy. In: Rencz AN (ed) *Remote Sensing for the Earth Sciences, Manual of Remote Sensing*, 3rd ed, vol 3, Am Soc Photogramm Remote Sens, Wiley, pp 357-374
- Lang HR, Alderman WH, Sabins FF (1985) Patrick Draw, Wyoming, petroleum test case report. The joint NASA/Geosat test case project, Sect 11, Am Assoc Petrol Geol Tulsa, Oklahoma
- Lang HR, Adams SL, Conel JE, McGuffie BA, Paylor Ed, Walker RE (1987) Multispectral remote sensing as stratigraphic and structural tool, Wind River Basin and Big Horn River Basin areas, Wyoming. *Am Assoc Petrol Geol Bull* 71(4):389-402
- Lathram EH, Gryc G (1973) Metallogenic significance of Alaskan geostructures seen from space. Proc 8<sup>th</sup> Int Symp of Environ Ann Arbor, MI, pp 1209-1211
- Lattman LH, Parizek RR (1964) Relationship between fracture traces and the occurrence of groundwater in carbonate rocks. *J Hydrol* 2:73-91
- Laubscher HP (1971) The large-scale kinematics of the western Alps and the western Apennines and its palinspastic implications. *AM J Sci* 271:193-226
- Leatherdale JD (1978) The practical contribution of space imagery to topographic mapping. Symp ISP Commission IV, Ottawa, Canada
- Leberl FW (1998) Radargrammetry. In: Henderson FM, Lewis AJ (eds) *Principles and Applications of Imaging Radar*. Manual of Remote Sensing, 3rd ed, Vol 2, Wiley, New York, pp 183-269
- Leberl FW, Olson D (1982) Raster scanning for operational digitizing of graphical data. *Photogramm Eng Remote Sens* 48:615-627
- Leckie DG (1982) An error analysis of thermal infrared line scan data for quantitative studies. *Photogramm Eng Remote Sens* 48:945-954
- Leckie DG (1990) Synergism of Synthetic Aperture Radar and Visible/Infrared Data for Forest Type Discrimination. *Photogramm Eng Remote Sens* 56(9):1237-1246
- Leckie DG (1998) Forestry applications using imaging radar. *Principles and Applications of Imaging Radar*. Manual of Remote Sensing, 3rd ed, Vol 2, Wiley, New York, pp 435-509

- Legg CA (1991) The Arabian Gulf oil slick, January and February 1991. *Int J Remote Sens* 12:1795-1796
- Lei Q, Henkel J, Frei M, Mehl. H, Lörchner G, Bodechtel J (1996) Radiometric noise correction of panchromatic high resolution data of MOMS-02. Proc MOMS-02 Symp, Cologne, Germany, 5-7 July 1995. Paris: Euro Assoc Remote Sens Lab (EARSeL):303-313
- Leick A (1995) GPS Satellite Surveying. 2<sup>nd</sup> ed, Wiley, New York
- Leuder DR (1959) Aerial photographic interpretation. McGraw Hill, New York
- Lewis AJ (ed) (1976) Geoscience applications of imaging radar systems. *Remote Sensing of the electromagnetic spectrum*, vol 3, No 3
- Lewis AJ, Henderson FM (1998) Radar fundamentals: the geoscience perspective. In: Henderson FM, Lewis AJ (eds) *Principles and Applications of Imaging Radar*. Manual of Remote Sensing, 3rd ed, Vol 2, Wiley, New York, pp131-181
- Li M, Daels L, Antrop M (1996) Lambertian and Minnaert relation simulation for topographic normalization. Proc 11<sup>th</sup> Thematic Conf Workshops App Geol Remote Sens, Las Vegas, Nevada, 27-29 February 1996. Ann Arbor Mich:Environ Res Inst Michigan 2:133-141
- Li ZR, McDonnell MJ (1988) Atmospheric Correction of Thermal Infrared Images. *Int J Remote Sens* 9(1):107-121
- Light DL (1981) Satellite photogrammetry. In: Slama CC (ed) *Manual of photogrammetry*. 4<sup>th</sup> edn. Am Soc Photogramm, Falls Church, VA, pp 883-977
- Lillesand TM, Kiefer RW (1987) *Remote sensing and image interpretation*, 2<sup>nd</sup> edn, Wiley, New York, 721 pp
- Lillesand TM, Keifer RW (2000) *Remote Sensing and Image Interpretation*. 4<sup>th</sup> edn, Wiley, New York, 724 pp
- Limaye SS, Suomi VE, Velden C, Tripoli G (1991) Satellite observation of smoke from oil fires in Kuwait. *Science* 252:1536-1539
- Lockwood JP, Lipman PW (1987) Holocene eruptive history of Mauna Loa volcano. In: Decker RW, Write TL, Stauffer PH (eds) *Volcanism in Hawaii*. Vol 1, USGS Prof Pap 1350, U S Geol Surv, Washington D C, pp 509-535
- Longley PA, Goodchild MF, Maguire DJ, Rhind DW (eds) (1999) *Geographical Information Systems*. Wiley, New York, 1-2
- Lou Y, Kim Y, Zyl J van (1996) The NASA/JPL airborne synthetic aperture radar system. Summaries of the 6<sup>th</sup> Annual AIRSAR Earth Science Workshop, JPL Publ 96-4, Vol 2, Jet Propulsion Laboratory, California Inst Tech, Pasadena, CA, pp 51-56
- Loughlin WP (1991) Principal Component Analysis for Alteration Mapping. *Photogramm Eng Remote Sens* 57(9):1163-1169
- Lowe DS (1969) Line scan devices and why we use them. Proc 5<sup>th</sup> Int Symp Remote Sens Environ, Ann Arbor, MI, pp 77-101
- Lowe DS (1976) Non-photographic optical sensors. In: Lintz J Jr, Simonett DS (eds) *Remote sensing environment*. Addison-Wesley, Reading, pp 155-193
- Lowman PD Jr (1969) Geologic orbital photography: experience from the Gemini program. *Photogrammetrica* 24: 77-106
- Lyon RJP (1962) Minerals in the infrared a critical bibliography. Stanford Res Inst Publ, Palo Alto CA, 76 pp
- Lyon RJP (1965) Analysis of rocks by spectral infrared emission (18 to 25 microns). *Econ Geol* 60:715-736
- Lyon RJP, Patterson JW (1966) Infared spectral signatures – a field geological tool. Proc 4<sup>th</sup> Int Symp Remote Sens Environ, Ann Arbor, MI, pp 215-220
- Lyon RJP, Elvidge C, Lyon JG (1982) Practical requirements for operational use of geobotany and biogeochemistry in mineral exploration. Proc Int Symp Remote Sens Environ, 2<sup>nd</sup> Thematic Conf Remote Sens Expl Geol, Fort Worth, Texas, pp 85-91

- MacDonald HC (1969) Geologic evaluation of radar imagery from Darien Province, Panama. *Mod Geol* 1:1-63
- MacDonald HC (1969) The influence of radar look direction on the detection of selected geologic features. *Proc 6<sup>th</sup> Int Symp Remote Sens Environ*, Ann Arbor, MI, pp 637-650
- MacDonald HC (1980) Techniques and applications of imaging radars. In: Siegal BS, Gillespie AR (eds) *Remote sensing in geology*. Wiley, New York, pp 297-336
- MacDonald HC, Waite WP (1973) Imaging radars provide terrain texture and roughness parameters in semi-arid environments, *Mod Geol* 4: 145-158
- Macias LF (1995) Remote sensing of mafic-ultramafic rocks: examples from Australian Precambrian terranes. *J Aust Geol Geophys* 16:163-171
- Madsen SN, Zebker HA (1998) Imaging radar interferometry. In: Henderson FM, Lewis AJ (eds) *Principles and Applications of Imaging Radar*, Manual of Remote Sensing, 3rd ed, Wiley, New York, 2:359-380
- Maguire DJ, Goodchild, MF, Rhind DW (eds) (1991) *Geographic Information Systems – Principles and Applications*. Harlow, Essex:Longman Scientific and Technical
- Mansor SB, Cracknell AP, Shilin BV, Gornyi VI (1994) Monitoring of Underground Coal Fires Using thermal Infrared Data. *Int J Remote Sens* 15(8):1675-1685
- Markham BL, Barker JL (1983) Spectral characterization of the Landsat-4 MSS sensors. *Photogramm Eng Remote Sens* 49(6): 811-833
- Markham BL, Barker JL (1986) Landsat MSS and TM post calibration dynamic ranges, exoatmospheric reflectances and at-satellite temperatures, *EOSAT Landsat Technical Notes* 1, August 1986, Earth Observation Satellite Co, (Lanham, Maryland), pp 3-8
- Marsh SE, Schieldge JP, Kahle AB (1982) An instrument for measuring thermal inertia in the field. *Photogramm Eng Remote Sens* 48:605-607
- Maselli F, Conese G, Petkov L, Resti R (1992) Inclusion of prior probabilities derived from a nonparametric process into the maximum likelihood classifier. *Photogramm Eng Remote Sens* 58:201-207
- Massonnet D, Feigl K (1998) Radar interferometry and its applications to changes in the earth's surface. *Rev Geophysics* 36(4):441-500
- Massonnet D, Rossi M, Carmona C, Adranga F, Peltzer G, Feigl K, Rabaute T (1993) The displacement field of the Landers earthquake mapped by radar interferometry. *Nature* 364:138-142
- Massonnet D, Feigl D, Rossi M, Adranga F (1994) Radar interferometric mapping of deformation in the year after the Landers earthquake. *Nature* 369:227-230
- Massonnet D, Briole P, Arnaud A (1995) Deflation of Mount Etna monitored by space-borne radar interferometry. *Nature* 375:567-570
- Masuoka EJ, Labovitz ML, Bell R, Nelson RF, Broderick PW, Ludwig RW (1982) The application of remote sensing in geobotanical exploration for metal sulfides. *Proc Int Symp Remote Sens Environ*, 2<sup>nd</sup> Thematic Conf Remote Sens Explor Geol, Fort Worth, Texas, 669pp
- Mather PM (1987) Computer processing of remotely sensed images, an introduction. Wiley, Chichester, 352 pp
- Mather PM (1999) Computer processing of remotely sensed images, an introduction. 2<sup>nd</sup> ed, Wiley, Chichester, 292 pp
- Matson M, Dozier J (1981) Identification of subresolution high temperature sources using a thermal infrared sensor. *Photogramm Eng Remote Sens* 47(9):1311-1318
- McCauley JF, Schaber GC, Breed CS, Grolier MJ, Haynes CV, Issawi B, Elachi C, Blom R (1982) Subsurface valleys and geoarcheology of the eastern Sahara revealed by shuttle radar. *Science* 218:1004-1019

- McDonald RA (1995) Opening the cold war sky to the public-declassifying satellite reconnaissance imagery. *Photogramm Eng Remote Sens* 61:385-390
- Mckinstry HE (1948) Mining geology. Prentice Hall, Englewood Cliffs, NJ, 680 pp
- Mees CEK, James TH (1966) The theory of the photographic processes. 3<sup>rd</sup> edn. Macmillan, New York
- Mekel JFM (1970) ITC textbook of photo-interpretation. Chap VIII.1 The use of aerial photographs in geology. ITC, Enschede
- Mekel JFM (1978) ITC textbook of photo-interpretation. Chap VIII. The use of aerial photographs and other images in geological mapping. ITC, Enschede
- Melen R, Buss D (ed) (1977) Charge-coupled devices: technology and applications. IEEE press (selected reprint series), New York, 415 pp
- Meyer P (1994) A parametric approach for the geocoding of Airborne Visible/Infrared Imaging Spectrometer (AVIRIS) data in rugged terrain. *Remote Sens Environ* 49:118-130
- Miller SH, Watson K (1977) Evaluation of algorithms for geological thermal inertia mapping. Proc 11<sup>th</sup> Symp Remote Sens Environ, Ann Arbor, MI, pt2, pp 1147-1160
- Miller SH, Watson K (1980) Thermal Infrared Aircraft Scanner Data of the Area of Underground Coal Fires, Sherodean, Wyoming, July 1975 and October 1978. Open Fire Report, p 5
- Miller VC, Miller CF (1961) Photogeology. McGraw-Hill, New York
- Milton NM, Collins W, Chang SH, Schmidt RG (1983) Remote detection of metal anomalies on Pilot Mountain, Randolph County, North Carolina. *Econ Geol* 78:605-617
- Miranda FP, McCafferty AE, Taranik JV (1994) Reconnaissance geologic mapping of a portion of the rain-forest-covered Guiana Shield, northwestern Brazil, using SIR-B and digital aeromagnetic data. *Geophysics* 59:733-743
- Moffitt FH, Mikhail EM (1980) Photogrammetry, 3<sup>rd</sup> edn. Harper & Row, New York
- Mohanty KK, Maiti K, Nayak S (2001) Monitoring water surges. *GIS@Development* Vol (3):32-33, <http://www.gis-development.net>
- Moik JG (1980) Digital processing of remotely sensed images. NASA SP-431, US Govt Printing Office, Washington, DC
- Moore GK, Waltz FA (1983) Objective procedures for lineament enhancement and extraction. *Photogramm Eng Remote Sens* 49: 641-647
- Morain SA (1976) Use of Radar for Vegetation analysis. *Remote Sensing of the Electromagnetic Spectrum* 3, CL 4:61-78
- Mouat DA (1982) The response of vegetation to geochemical conditions. Proc Int Symp Remote Sens Environ, 2<sup>nd</sup> Thematic Conference Remote Sens Explor Geol, Fort Worth, Texas, pp 75-84
- Murakami M, Fujiwara S, Nemoto M, Saito T (1995) Application of the interferometric JERS-1 SAR for detection of crustal deformations in the Izu Peninsula, Japan, *Eos Trans, AGU*, 76 suppl, F63
- Mustard JF, JM Sunshine (1999) Spectral analysis for earth science: Investigations using remote sensing data. In: Rencz AN (ed) *Remote Sensing for the Earth Sciences, Manual of Remote Sensing*, 3rd ed, Vol 3, Am Soc Photogramm Remote Sens, Wiley, New York, pp 251-306
- Nagarajan R, Mukherjee A, Roy A, Khire MV (1998) Temporal remote sensing data and GIS application in landslide hazard zonation of part of Western Ghat, India. *Int J Remote Sens* 19(4):573-585
- Naraghi M, Stromberg W, Daily M (1983) Geometric rectification of radar imagery using digital elevation models. *Photogramm Eng Remote Sens* 49:195-199
- Nelson R (1985) Reducing Landsat MSS scene variability. *Photogramm Eng Remote Sens* 51:583-593

- Nishidai T (1993) Early results from 'Fuyo-1' Japan's Earth Resources Satellite (JERS-1). *Int J Remote Sens* 14:1825-1833
- O'Leary DW, Friedman JD, Pohn HA (1976) Lineament, linear and lineation: some proposed new standards for old terms. *Geol Soc Am Bull* 87:1463-1469
- O'Leary DW, Johnson GR, England AW (1983) Fracture detection by airborne microwave radiometry in parts of the Mississippi embayments, Missouri and Tennessee. *Remote Sens Environ* 13: 509-523
- Offield TW, Abbott EA, Gillespie AR, Loguercio SO (1977) Structure mapping on enhanced Landsat images of southern Brazil: tectonic control of mineralization and speculation on metallogeny, *Geophysics* 42:482-500
- Oppenheimer C (1991) Lava flow cooling estimated from Landsat Thematic Mapper infrared data: the Lonquimay eruption, Chile, 1989. *J Geophys Res* 96:21,865-21,878
- Oppenheimer C, Francis PW, Rothery DA, Carlton RW, Glaze LS (1993) Infrared image analysis of volcanic thermal features: Volcan Lascar, Chile, 1984-1992. *J Geophys Res* 98:4269-4286
- Ortega GE (1986) Introduction to the geology and metallogeny of the Almaden area, Castro-Iberian zone, Spain. Proc 2<sup>nd</sup> European Workshop on Remote Sensing in Mineral Exploration EEC, Brussels
- Quadrari Hassan, Vermote Eric F (1999) Operational atmospheric correction of Landsat TM Data. *Remote Sens Environ* 70: 4-15
- Pachauri AK, Pant M (1992) Landslide hazard mapping based on geological attributes. *Eng Geol* 32:81-100
- Palluconi FD, Meeks GR (1985) Thermal Infrared Multispectral Scanner (TIMS): An Investigator's Guide to TIMS Data, JPL Publ 85-32, Jet Propulsion Laboratory, California Inst Tech, Pasadena, CA
- Pandey SN (1987) Principles and applications of photogeology. Eastern Wiley, New Delhi, 366 pp
- Parasnis DS (1980) Principles of applied geophysics, 3<sup>rd</sup> edn, Chapman and Hall, London, 275pp
- Parizek RR (1976) Lineaments and groundwater. In: McMurtry GT, Petersen GW (eds) Interdisciplinary application and interpretations of EREP data within the Susquehanna River basin. Pennsylvania State Univ, pp 4-59 to 4-86
- Parlow E (ed) (1996a) Progress in Environmental Remote Sensing Research Applications. Proc 15<sup>th</sup> EARSeL Symp, Basle Switzerland, 4-6 September 1996. Rotterdam: A.A. Balkema
- Parvis M (1950) Drainage pattern significance in airphoto identification of soils and bedrocks. *Photogramm Eng* 16:387-409
- Peak WH, Oliver TC (1971) The response of terrestrial surfaces at microwave frequencies. Ohio State Univ Electrosic Lab 2440-7 Tech Rep AFAL-TR70-301, p 255
- Peddle DR (1993) An empirical comparison of evidential reasoning, linear discriminant analysis, and maximum likelihood algorithms for land cover classification. *Can J Remote Sens* 19:31-44
- Peli T, Malah D (1982) A study of edge detection algorithms. *Computer Graphics Image Processing* 20:1-21
- Peters WC (1978) Exploration mining and geology. Wiley, New York, 644pp
- Peterson DL, Aber JD, Matson PA, Card DH, Swanberg N, Wessman C, Spanner M (1988) Remote sensing of forest canopy and leaf biochemical contents. *Remote Sens Environ* 24:85-108
- Philip G, Gupta RP, Manickavasgam RM (1988) Geoenvironmental studies in Singrauli coal belt (MP and UP). *Geosciences J IX*:205-214

- Philip G, Gupta RP, Bhattacharya A (1989) Channel migration studies in the middle Ganga basin, India, using remote sensing data. *Int J Remote Sens* 10:1141-1149
- Pichel W, Bristor CL, Brower R (1973) Artificial stereo: a technique for combining multi-channel satellite image data. *Bull Am Meteorol Soc* 54:688-690
- Pitas I (1993) Digital Image Processing Algorithms. Prentice-Hall, Englewood Cliffs, NJ
- Podwysocki MH, Segal DB, Abrams MJ (1983) Use of multispectral scanner images for assessment of hydrothermal alteration in the Marysvale, Utah mining area. *Econ Geol* 78: 675-687
- Pohl C, van Genderen JL (1998) Multisensor image fusion in Remote sensing: concepts, methods and application. *Int J Remote Sens* 19:823-854
- Pohn HA, Offield TW, Watson K (1974) Thermal inertia mapping from satellite – discrimination of geologic units in Oman. *J Res US Geol Surv* 2:147-158
- Prakash A, Gupta RP (1998) Land-use mapping and change detection in coal mining area - a case study in the Jharia Coalfield, India. *Int J Remote Sens* 19(3):391-410
- Prakash A, Gupta RP (1999) Surface fires in the Jharia coalfield, India- their distribution and estimation of area and temperature from TM data. *Int J Remote Sens* 20(10): 1935-1946
- Prakash A, Saraf AK, Gupta RP, Dutta M, Sundaram RM (1995a) Surface thermal anomalies associated with underground fires in Jharia coal mines, India. *Int J Remote Sens* 16(12):2105-2109
- Prakash A, Sastry RGS, Gupta RP, Saraf AK (1995b) Estimating the depth of buried hot features from thermal IR remote sensing data: a conceptual approach. *Int J Remote Sens* 16(13):2503-2510
- Prakash A, Gupta RP, Saraf AK (1997) A landsat TM based comparative study of surface and subsurface fires in the Jharia coalfield, India. *Int J Remote Sens* 18(11):2463-2469
- Prakash A, Fielding EJ, Gens R, van Genderen JL, Evans DL (2001) Data fusion for investigating land subsidence and coal fire hazards in a coal mining area. *Int J Remote Sens* 22:921-932
- Prakash S (1981) Soil dynamics. McGraw-Hill, New York, pp 274-339
- Prasad SN, Rao MNA, Mookherjee A (1984) Mine planning- A step towards modernisation, Coal Mining in India , CMPDIL publication, 12th World Mining Congress, New Delhi
- Prata AJ (1995) Thermal remote sensing of land surfaces temperature from satellites- current status and future prospects. *Remote Sens Rev* 12:175-224
- Pratt WK (1978) Digital image processing. Wiley, New York
- Price JC (1977) Thermal inertia mapping: a new view of the Earth. *J Geophys Res* 81:2582-2590
- Price JC (1983) Estimating Surface Temperatures from Satellite Thermal Infrared Data-A Simple Formulation for the Atmospheric Effect. *Remote Sens Environ* 13:353-361
- Price JC (1988) An update on visible and near infrared calibration of satellite instruments. *Remote sens Environ* 24:419-422
- Price JC (1998) An update on visible and near infrared calibration of satellite instruments. *Remote Sens Environ* 24:419-422
- Price NJ, Cosgrove J (1990) Analysis of Geological Structures. Cambridge University Press, 502pp
- Proy C, Tanre D, Deschamps PY (1989) Evaluation of topographic effects in remotely sensed data. *Remote Sens Environ* 30:21-32
- Puglisi G, Coltelli M (1998) SAR interferometry applications on active volcanoes: state of the art and perspectives for volcano monitoring. Workshop Synthetic Aperture Radar, 25-26 February 1998, Florence, Italy

- Quinn MF et al. (1994) Measurement and analysis procedures for remote identification of oil spills using a laser fluorosensor. *Int J Remote Sens* 15:2637-2658
- Rahman H, Dedieu G (1994) SMAC: a simplified method for the atmospheric measurements in the solar spectrum. *Int J Remote Sens* 15(1):123-143
- Rama Rao JV (1999) Geological and structural inference of Shillong massif from aeromagnetic data. *J Geophysics, Assoc Explor Geophysicists*, vol xx (1), pp 21-24
- Ranchin T, Wald L (1998) Fusion of airborne and spaceborne images in visible range. *Operational Remote Sensing for Sustainable Development*, Noeuwenhuis, Vaughan & Molennar (eds), pp 255-260
- Ranson KJ Sun G (1994) Northern forest classification using temporal multifrequency and multipolarization SAR images. *Remote Sens Environ* 47(2):142-153
- Rao DP, Subramanian SK (1997) Geomorphic analysis of IRS-1C PAN stereo image. *Interface*, (NRSA, Hyderabad), Vol 8, No 2 (April-June), pp 4-5
- Rao YSN, Rahman AA, Rao DP (1974) On the structure of the Siwalik range between the rivers Yamuna and Ganga. *Himalayan Geol*, vol 4, pp 137-150
- Rast M (1992) ESA's Activities in the field of imaging spectroscopy. In: Toselli F, J Bodechtel (eds) *Imaging Spectroscopy: Fundamentals and Prospective Applications*. Kluwer, Dordrecht, pp 167-191
- Rast M, Hook SJ, Elvidge CD, Alley RE (1991) An evaluation of techniques for the extraction of mineral absorption features from high spectral resolution remote sensing data. *Photogramm Eng Remote Sens* 57:1303-1309
- Ray RG (1965) Aerial photographs in geologic interpretation and mapping. USGS Prof Paper 373
- Realmuto VJ (1990) Separating the effects of stemperature and emissivity:emissivity spectrum normalization in Proceedings of the 2<sup>nd</sup> TIMS Workshop, JPL Publ. 90-55, Jet Propulsion Laboratory, California Inst Tech, Pasadena, CA
- Rebillard P, Evans P (1983) Analysis of coregistered Landsat, Seasat and SIR-A images of varied terrain types. *Geophys Res Lett* 10(4):277-280
- Reeves RG (1968) Introduction to electromagnetic remote sensing with emphasis on applications to geology and hydrology. *Am Geol Inst*, Washington, DC
- Reeves RG (ed) (1975) Manual of remote sensing. 1st edn, Am Soc Photogramm, Falls Church, VA
- Reinhackel G, Kruger G (1998) Combined use of laboratory and airborne spectrometry from the reflective to Thermal wavelength range for a quantitative analysis of lignite overburden dumps. *27<sup>th</sup> R S E Int Symp, R S E Tromsoe*, Norway, pp 507-512
- Rencz AN, Bowie C, Ward B (1996) Application of thermal imagery from Landsat data to identify kimberlites, Lac de Gras area, District of Mackenzie, N.W.T. In: LeChaimant AN, Richardson DG, DiLabio RNW, Richardson KA (eds). *Searching for diamonds in Canada*, Geol Surv Canada, Open File 3228:255-257
- Rib HT (1975) Engineering: regional inventories, corridor surveys and site investigations. In: Reeves RG (ed) *Manual of remote sensing*. Am Soc Photogramm, Falls Church, VA, pt 2, pp 1881-1945
- Rib HT, Liang TA (1978) Recognition and identification. In: Schuster RL, Krizek RV (eds) *Landslides analysis and control*. Trans Res Board Nat Res Council USA Spec Rep 176:34-80
- Ricci M (1982) Dip determination in photogeology. *Photogramm Eng Remote Sens* 48:407-414
- Rice DP, Malila WA (1983) Investigation of radiometric properties of Landsat-4 MSS. *Proc Symp Landsat-4 Characterization, Early Results*, Goddard Space Flight Center, Greenbelt, Maryland

- Richards JA, Jia X (1999) Remote Sensing Digital Image Analysis. 3<sup>rd</sup> ed, Springer Verlag, Heidelberg, 363pp
- Richter R (1996) A spatially adaptive fast atmospheric correction algorithm. Int J Remote Sens 17:1201-1214
- Robbins J, Seigel HO (1982) The luminex method – a new active remote sensing method for exploration for mineral deposits. Proc Int Symp Remote Sens Environ, 2<sup>nd</sup> Thematic Conf Remote Sens Explor Geol, Fort Worth, Texas, pp 203-204
- Robinove CJ (1982) Computation of physical values from Landsat digital data. Photogram Eng Remote Sens 48:781-784
- Rocca F, Prati C, Feretti (1997) An overview of ERS-SAR interferometry, 3<sup>rd</sup> ERS Symposium, Space at the Service of Our Environment, Florence, 17-21 March, 1997, ESA-SP-414, Vol 1, pp xxvii-xxxvi <http://florence97.erssymposium.org>
- Rock BN, Hoshizaki T, Miller Jr (1988) Comparison of in-situ and airborne spectral measurements of the blue-shift associated with forest decline. Remote Sens Environ 24:109-127
- Rogers AE, Ingalls RP (1969) Venus: Mapping the surface Reflectivity by Radar Interferometry. Science 165: 797-799
- Rosen PA, Hensley S, Joughin IR, Li F, Madsen SN, Rodriguez E, Goldstein RM (1999) Synthetic aperture radar interferometry. Proc IEEE XX(Y):1-110
- Rosenfeld A, Kak AC (1982) Digital picture processing, 2<sup>nd</sup> edn, Academic Press, Orlando, FLA
- Rothery DA, Francis PW, Wood CA (1988) Volcano monitoring using short wavelength IR data from satellites. J Geophys Res 93(B7):7993-8008
- Rowan LC, Bowers TL (1995) Analysis of linear features mapped in Landsat thematic mapper and side-looking radar images of the Reno, Nevada-California 1° X 2° quadrangle: implications of mineral resource studies. Photogramm Eng Remote Sens 61:749-759
- Rowan LC, Wetlaufer PH, Goetz AFH, Billingsley FC, Stewart JH (1974) Discrimination of rock types and detection of hydrothermally altered areas in south-central Nevada by use of computer-enhanced ERTS images, USGS prof Pap 883, p35
- Rowan LC, Goetz AFH, Ashley RP (1977) discrimination of hydrothermally altered and unaltered rocks in visible and near-infrared multispectral images. Geophysics 42:522-535
- Rowan LC, Goetz AFH, Crowley JK, Kingston MJ (1983) Identification of hydrothermal mineralization in Baja California, Mexico, from orbit using the shuttle multispectral infrared radiometer. Proc Int Geosci Remote Sens Symp (IGARRS) vol 1, pp3.1-3.9
- Rowan LC, Watson K, Crowley JK, Anton-Pancheo C, Gumiell P, Kingston MJ, Miller SH, Bowers TL (1993) Mapping lithologies in the Iron Hill, Colorado, carbonatite alkalic igneous rock complex using thermal infrared multispectral scanner and airborne visible-infrared imaging spectrometer data. Proc 9<sup>th</sup> Thematic Conf Geol Remote Sens, Vol I, Env Res Inst Michigan, Ann Arbor, Mich, pp 195-197
- Roy Chowdhary MK, Das Gupta SP (1965) Ore localization in Khetri copper belt. Econ Geol 60:69-88
- Roy SC (1939) Seismometric study. Mem Geol surv India 73:49-75
- Ruiz-Armenta JR, Prol-Ledesma RM (1998) Techniques for enhancing the spectral response of hydrothermal alteration minerals in Thematic Mapper images of Central Mexico. Int J Remote Sens 19(10):1981-2000
- Russ JC (1995) The Image Processing Handbook. 2<sup>nd</sup> ed., CRC Press, Boca raton, FL
- Ryerson RA, Morain SA, Budge AM, (eds) (1997) The Manual of Remote Sensing, 3<sup>rd</sup> edn, Earth Observing Platforms and Sensors (CD-ROM). Am Soc Photogramm Engg Remote Sens

- Sabine C (1999) Remote sensing strategies for mineral exploration. *Remote Sensing for the Earth Sciences, Manual of Remote Sensing*, 3<sup>rd</sup> edn, Am Soc Photogramm Remote Sens, John Wiley, Vol 3, pp 375-447
- Sabine C, Realmuto VJ, Taranik JV (1994) Quantitative estimation of granitoid composition from thermal infrared multispectral scanner (TIMS) data, Desolation Wilderness, northern Sierra Nevada, California. *J Geophys Res* 99(B3):4261-4271
- Sabins FF Jr (1969) Thermal infrared imagery and its application to structural mapping in southern California. *Geol Soc Am Bull* 80:397-404
- Sabins FF Jr (1983) Geologic interpretation of space shuttle radar images of Indonesia. *Am Assoc Petrol Geol Bull* 67:2076-2099
- Sabins FF Jr (1987) Remote sensing principles and interpretation. 2<sup>nd</sup> edn, Freeman, San Francisco, 449 pp
- Sabins FF Jr (1997) *Remote Sensing—Principles and Interpretation*. 3<sup>rd</sup> ed, Freeman & Co, NY
- Sabins FF Jr, Blom R, Elachi C (1980) Seasat radar image of San Andreas fault, California. *Am Assoc Petrol Geol Bull* 64:619-628
- Saha AK, Gupta RP, Arora MK (2002) GIS-based landslide hazard zonation in the Bhagirathi (Ganga) Valley, Himalayas. *Int J Remote Sens* 23(2):357-369
- Salisbury JW, Hunt GR (1974) Remote sensing of rock type in the visible and near infrared. *Proc 9<sup>th</sup> Int Symp Remote Sens Environ*, Ann Arbor, MI, vol III, pp 1953-1958
- Saraf AK, Prakash A, Sengupta S, Gupta RP (1995) Landsat-TM data for estimating ground temperature and depth of subsurface coal fire in the Jharia coalfield, India. *Int J Remote Sens* 16(12):2111-2124
- Sawchuk AA (1978) Artificial stereo. *App Optics* 17:3869-3873
- Scarpone FL, Madding RP, Green T III (1975) Scanning thermal plumes. *Photogramm Eng* 41:1223-1231
- Schaber GG, Berlin GL, Brown WE Jr (1976) Variations in surface roughness within Death Valley, California, geologic evaluation on 25-cm wavelength radar images. *Geol Soc Am Bull* 87:29-41
- Schalkoff RJ (1992) *Pattern Recognition: Statistical, Structural and Neural Approaches*. Wiley, New York
- Schanda E (1986) *Physical fundamentals of remote sensing*. Springer, Berlin Heidelberg New York Tokyo, 187 pp
- Schetselaar EM (1998) Fusion by the IHS transform: should we use cylindrical or spherical coordinates? *Int J Remote Sens* 19:759-765
- Schmugge T (1980) Techniques and applications of microwave radiometry. In: Siegel BS, Gillespie AR (eds) *Remote sensing in geology*. Wiley, New York, pp 337-361
- Schott JR (1989) Image processing of thermal infrared images. *Photogramm Eng Remote Sens* 55(9):1311-1321
- Schott JR, Volchok WJ (1985) Thematic Mapper thermal infrared calibration. *Photogramm Eng Remote Sens* 51:1351-1357
- Schowengerdt RA (1997) *Remote Sensing: Models and Methods for Image processing*. 2<sup>nd</sup> edn, San Diego: Academic Press
- Schultejann PA (1985) Structural trends in Borrego Valley, California: interpretations from SIR-A and SEASAT SAR. *Photogramm Eng Remote Sens* 51:1615-1624
- Seeber L, Armbruster JG, Quitmeyer RC (1981) Seismicity and continental subduction in the Himalayan arc. *Inter Union Commission on Geodynamics, Working Group* 6:215-242

- Segal DB (1982) Theoretical basis for differentiation of ferric-iron bearing minerals, using Landsat MSS data. Proc Symp Remote Sens Environ, 2<sup>nd</sup> Thematic Conf Remote Sens Explor Geol, Fort Worth, Texas, pp 949-951
- Segal DB (1983) Use of Landsat multispectral scanner data for the definition of limonitic exposures in heavily vegetated areas. Econ Geol 78:711-722
- Sellers PJ (1985) Canopy reflectance – photosynthesis and transpiration. NASA Contract Rep 177822, Greenbelt, MD, NASA Goddard Space Flight Center.
- Sellers WD (1965) Physical climatology. Univ Chicago Press, Chicago, 272 pp
- Sen D, Sen S (1983) Post-Neogene tectonism along the Aravalli range, Rajasthan, India. Tectonophysics 93:75-98
- Settle JJ, Drake NA (1993) Linear mixing and the estimation of ground cover proportions. Int J Remote Sens 14:1159-1177
- Settle M (1984) The Joint NASA/Geosat test case project. Executive summary, pt 1, Am Assoc Petrol Geol, AAPG Book store, Tulsa, Oklahoma, p 30
- Sharma RP (1977) The role of ERTS-1 multispectral imagery in the elucidation of tectonic framework and economic potentials of Kumaun and Simla Himalaya. Himalayan Geol 7: 77-99
- Sharma RS (1988) Patterns of metamorphism in the Precambrian rocks of the Aravalli mountain belt. Mem Geol Soc Ind 7:33-75
- Shaw GB (1979) Local and regional edge detectors: some comparisons. Computer Graphics Image Processing 9:135-149
- Sheffield C (1985) Selecting band combinations from multispectral data. Photogramm Eng Remote Sens 51:681-687
- Short NM (1986) Volcanic landforms. In: Short NM, Blair RW Jr (eds) Geomorphology from space. NASA SP-486 US Govt Printing Office, Washington, DC, pp 185-254
- Short NM, Blair RW Jr (eds) (1986) Geomorphology from space NASA SP-486 US Govt Printing Office, Washington, DC
- Short NM, Stuart LM Jr (1982) The Heat Capacity Mapping Mission (HCMM) anthology. NASA SP-465, US Govt Printing Office, Washington, DC, p 264
- Short NM, Lowman PD Jr, Freden SC, Finch WA Jr (1976) Mission to the Earth: Landsat views the world. NASA SP-360 US Govt Printing Office, Washington, DC, p 459
- Siegel BS (1977) Significance of operator variation and the angle of illumination in lineament analysis on synoptic images. Mod Geol 6:75-85
- Siegel BS, Abrams MJ (1976) Geologic mapping using Landsat data. Photogramm Eng Remote Sens 42:325-337
- Siegel BS, Goetz AFH (1977) Effect of vegetation on rock and soil type discrimination. Photogramm Eng Remote Sens 43:191-196
- Silva LF (1978) Radiation and instrumentation in remote sensing. In: Swain PH, Davis SM (eds) Remote sensing: the quantitative approach. McGraw Hill, New York, pp 21-135
- Singhal BBS, Gupta RP (1999) Applied Hydrogeology of Fractured Rocks. Kluwer, Dordrecht, 393p
- Singhroy VH, Kruse FA (1991) Detection of metal stress in boreal forest species using the 0.67  $\mu\text{m}$  chlorophyll absorption band. Proc 8<sup>th</sup> Thematic Conf Geol Remote Sens, Vol I, Env Res Inst Michigan, Ann Arbor, Mich, pp 361-372
- Sinha PR (1986) Mine fires in Indian coalfields. Energy 11(11/12):1147-1154
- Slama CC (ed) (1981) Manual of photogrammetry. 4<sup>th</sup> edn, Am Soc Photogramm, Falls Church, VA, 1056 pp
- Slater PN (1975) Photographic remote sensing. In: Reeves RG (ed) Manual of remote sensing. Am Soc Photogramm, Falls Church, VA, pp 235-323
- Slater PN (1979) A re-examination of the Landsat MSS. Photogramm Eng Remote Sens 45: 1479-1485

- Slater PN (1980) Remote sensing – optics and optical systems. Addison Wesley, Reading, 575 pp
- Slater PN (1983) Photographic systems for remote sensing. In: Colwell RN (ed) Manual of remote sensing. 2<sup>nd</sup> edn, Am Soc Photogramm, Falls Church, VA, pp 231-291
- Slater PN (1985) Survey of multispectral imaging systems for earth observations. *Remote Sens Environ* 17:85-102
- Slavecki RJ (1964) Detection and location of subsurface coal fire. Proc 3rd Symp, Remote Sens Environ, October 14-16, 1964, pp 537-547, University of Michigan, Ann Arbor, MI
- Small D, Pasquali P, Füglister S (1966) A comparison of phase to height conversion methods for SAR interferometry. Proc IGARSS '96, Lincoln, Nebraska, pp 342-344
- Smirnov V (1976) Geology of mineral deposits. Mir, Moscow
- Smith HTU (1943) Aerial photographs and their application. Appleton-Century, New York, 372 pp
- Smith JA, Lin TL, Ranson KJ (1980) The lambertian assumption and Landsat Data. *Photogramm Eng Remote Sens* 46(9):1183-1189
- Smith JT Jr (1968) Filters for aerial photography. In: Smith JT Jr, Anson A (ed) Manual of colour aerial photography. Am Soc Photogramm, Falls Church, VA, pp 189-195
- Smith JT Jr, Anson A (eds) (1968) Manual of colour aerial photography. Am Soc Photogramm, Falls Church, VA
- Smith MO, Johnson PE, Adams JB (1985) Quantitative determination of mineral types and abundances from reflectance spectra using principal component analysis. *J Geophys Res* 90 (Suppl): C797-C804
- Solaas GA (1994) ERS-1 interferometric baseline algorithm verification. ESA Technical Report ES-TN-DPE-OM-GS02
- Stanton RL (1972) Ore petrology. McGraw Hill, New York, 713 pp
- Star J, Estes J (1990) Geographic Information Systems: An Introduction. Prentice Hall, Englewood Cliffs, New Jersey
- Stofan ER, Evans DL, Schmullius C, Holt B, Plaut J, Zyl J van, Wall SD, Way J (1995) Overview of results of Spaceborne Imaging Radar-C, X-band Synthetic Aperture Radar (SIR-C/X-SAR). *IEEE Trans Geosci Remote Sens* 33:817-828
- Stohr CJ, West TR (1985) Terrain and look angle effects upon multispectral scanner response. *Photogramm Eng Remote Sens* 51:229-235
- Stow RJ, Wright P (1997) Mining subsidence land survey by SAR interferometry. 3rd ERS Symposium, ESA-SP 414, Vol 1, pp 525-530
- Strahler AH (1980) The use of prior probabilities in maximum likelihood classification of remotely sensed data. *Remote Sens Environ* 10:135-163
- Strahler AH, Logan TL, Bryant NA (1978) Improving forest cover classification accuracy from Landsat by incorporating topographic information. Proc 12<sup>th</sup> Symp Remote Sens Environ, Ann Arbor, MI, vol II, pp 927-942
- Strahler AH, Estes JE, Maynard PF, Mertz FC, Stow DA (1980) Incorporating collateral data in Landsat classification and modelling procedures. vol II, 14<sup>th</sup> Symp, Remote Sens Environ, Ann Arbor, Michigan, pp 1009-1026
- Strauss GK, Roger G, Lecolle M, Lopera E (1981) Geochemical and geological study of the volcano-sedimentary sulfide orebody of La Zarza-Huelva, Spain. *Econ Geol* 76:1975-2000
- Stringer WJ et al. (1992) Detection of petroleum spilled from the MV Exxon Valdez. *Int J Remote Sens* 13:799-824
- Suits GH (1983) The nature of electromagnetic radiation. In: Colwell RN (ed) Manual of remote sensing. Am Soc Photogramm, Falls Church, VA, pp 37-60

- Sundaram RM (1998) Integrated GIS Studies for Delineation of Earthquake-Induced Hazard Zones in Parts of Garhwal Himalaya. Ph.D thesis, Department of Earth Sciences, University of Roorkee, 135pp
- Swain PH (1978) Fundamentals of pattern recognition in remote sensing. In: Swain PH, Davis SM (eds) *Remote sensing: the quantitative approach*. McGraw Hill, New York, pp 136-187
- Tanre D, Derou C, Duhaut P, Herman M, Morcrette JJ, Perbos J, Deschamps P Y (1990) Description of a computer code to simulate the satellite signal in the solar spectrum: the 5S code. *Int J Remote Sens* 11(4):659-668
- Taranik DL, Kruse FA, Goetz AFH, Atkinson WW (1991) Remote sensing of ferric iron minerals as guides for gold exploration. *Proc 8<sup>th</sup> Thematic Conf Geol Remote Sens*, Vol I, Env Res Inst Michigan, Ann Arbor, Mich, pp 197-205
- Taranik JV (1978) Principles of computer processing of Landsat data for geologic applications. USGS Open File Rep 78-177, Sioux Falls, South Dakota
- Tator BA (1960) Photo interpretation in geology. In: Colwell RN (ed) *Manual of photographic interpretation*. Am Soc Photogramm, Falls Church, VA, pp 169-342
- Tauch R, Kähler M (1988) Improving the quality of satellite images maps by various processing techniques. *Int Archives of Photogrammetry & RS*, Proc. XVI ISPRS Congress, Tokyo, Japan, pp IV238-IV247
- Teillet PM, Fedosejevs G (1995) On the dark target approach to atmospheric correction of remotely-sensed data. *Canadian J Remote Sens* 21:374-387
- Teillet PM, Guindon B, Goodenough DG (1982) On the slope-aspect correction of multispectral data. *Canadian J Remote Sens* 8:84-106
- Teng WL et al. (1997) Fundamentals of photographic interpretation. In: Philipson WR (editor-in-chief) *Manual of Photographic Interpretation*, 2<sup>nd</sup> ed, Am Soc Photogramm Remote Sens, Bethesda, Md, pp 49-113
- Thiruvengadachari S, Kalpana AR (eds) (1986) Indian Remote Sensing Satellite – data users handbook. Department of Space Govt of India, NRSA data centre, Hyderabad, 110 pp
- Thomas IL, Howorth R, Eggers A, Fowler ADW (1981) Textural enhancement of a circular geological feature. *Photogramm Eng Remote Sens* 47:89-91
- Thome KJ, Gellman DI, Parada RJ, Biggar SF, Slater PN, Moran MS (1993) Absolute radiometric calibration of Thematic Mapper. *SPIE Proc* 600:2-8
- Thompson LL (1979) Remote sensing using solid state array technology. *Photogramm Eng Remote Sens* 45:47-55
- Thornbury WD (1978) *Principles of geomorphology*. 2<sup>nd</sup> edn, Wiley, New York
- Todd DK (1980) *Groundwater hydrology*. 2<sup>nd</sup> edn, Wiley, New York
- Tom Ch, Miller LD (1984) An automated land-use mapping comparison of the Bayesian maximum likelihood and linear discriminant analysis algorithms. *Photogramm Eng Remote Sens* 50:193-207
- Townshend JRG (ed) (1981) *Terrain analysis and remote sensing*. George Allen & Unwin, London, pp 38-54
- Tracy RA, Noll RE (1979) User-oriented data processing considerations in linear array applications. *Photogramm Eng Remote Sens* 45:57-61
- Trevett JW (1986) Imaging radar for resources surveys. Chapman and Hall, London, 313 p
- Turner RE, Malila WA, Nalepka RF, Thomson FJ (1974) Influence of the atmosphere on remotely sensed data. *Proc Soc Photo-Optical Instrument Eng*. Vol 51, Scanners and Imagery Systems for Earth Observations, San Diego, CA, pp 101-114
- Ulaby FT, Goetz AFH (1987) Remote sensing techniques. *Encyclopedia of physical science and technology*, vol 12. Academic Press, New York, pp 164-196

- Ulaby FT, Moore RK, Fung AK (1981) *Microwave remote sensing-active and passive*, vol I, microwave remote sensing fundamentals and radiometry. Addison-Wesley, Reading
- Ulaby FT, Moore RK, Fung AK (1982) *Microwave remote-sensing active and passive*, vol II, radar remote sensing and surface scattering and emission theory. Addison – Wesley, Reading
- Ulaby FT, Brisco B, Dobson MC (1983) Improved spatial mapping of rainfall events with spaceborne SAR imagery. *IEEE Trans Geosci Remote Sens GE-21*:118-121
- Ulaby FT, Moore RK, Fung AK (1986) *Microwave remote senisng: active and passive*, vol III, from theory to applications. Artech House, Delham, Mass
- van der Meer F (1994) Mapping the degree of serpentinization within ultramafic rock bodies using imaging spectrometer data. *Int J Remote Sens 15*(18):3851-3857
- van der Meer F (1999) Imaging spectrometry for geologic remote sensing. *Geologie en Mijnbouw 77*:137-151
- van der Meer F, Bakker W (1997) CCSM: Cross Correlogram Spectral Matching. *Int J Remote Sens 18*:1197-1201
- van der Meer F, Bakker W (1998) Validated surface mineralogy from high-spectral resolution remote sensing: a review and a novel approach applied to gold exploration using AVIRIS data. *Terra Nova 10*:112-119
- van der Meer F, Yang H, Lang H (2001) Imaging spectrometry and geological applications. In: van der Meer F & de Jong S (ed.) *Imaging spectrometry: Basic Principles and Prospective Applications*. Kluwer, Dordrecht
- van Westen CJ (1994) GIS in landslide hazard zonation: a review, with examples from the Andes of Columbia. In: Price M, Heywood I (eds) *Mountain Environments and Geographic Information System*. Taylor & Francis, Basingstoke, UK, pp 135-165
- Vane G, Goetz AFH (1988) Terrestrial imaging spectroscopy. *Remote Sens Environ 24*:1-29
- Vane G, Goetz AFH, Wellman JB (1983) Airborne imaging spectrometer: a new tool for remote sensing. *Proc IEEE Int Gremote Sens Symp (IGARSS) FA-4*:6.1-6.5
- Vane G, Green RO, Chrien TG, Enmark HT, Hansen EG, Porter (1993) The Airborne Visible/Infrared Imaging Spectrometer (AVIRIS). *Remote Sens Environ 44*:127-143
- Varnes (1984) Landslide hazard zonation: a review of principles and practice. UNESCO, Paris, pp 1-63
- Vermote EF, Tanre D, Denze JL, Herman M, Morcrette JJ (1997) Second simulation of the satellite signal in the solar spectrum, 6S: an overview. *IEEE Trans Geosc Remote Sens 35*:675-686
- Verstappen HT (1983) *Applied geomorphology*. Elsevier, Amsterdam 437 pp
- Vickers RS, Lyon RJP (1967) Infrared sensing from spacecraft – a geological interpretation. *Proc Thermophysics spec conf, Am Inst Aeronautics Astronautics*, Pap 67-284, p10
- Vincent RK, Thomson FJ (1972) Rock type discrimination from ratioed infrared scanner images of Pisgah Crater, California. *Science 175*:986-989
- Vincent RK, Thomson FJ, Watson K (1972) Recognition of exposed quartz sand and sandstone by two-channel infrared imagery. *J Geophys Res 77*:2473-2477
- Vizy KN (1974) Detecting and monitoring oil slicks with aerial photos. *Phtogramm Eng 40*:697-708
- Vlcek J (1982) A field method for determination of emissivity with imaging radiometers. *Photogramm Eng Remote Sens 48*:609-614
- Vlcek J, King D (1985) Development and use of a 4-camera video system for resource surveys. *Proc 19<sup>th</sup> Int Symp Remote Sens Environ (Environ Res Inst Michigan)*, University of Michigan, Ann Arbor, MI, pp 483-489

- Volk P (1985) Untersuchungen an geologischen, fernerkundlichen und geophysikalischen Daten und deren interpretationsoptimierten Darstellungen für die Exploration in der SE-Iberischen Kiesprovinz. PhD dissertation, Univ Munich, 154 pp
- Volk P, Haydn R, Bodechtel J (1986) Integration of remote sensing and other geodata for ore exploration – a SW Iberian case study. Proc Int Symp Remote Sens Environ, 5<sup>th</sup> Thematic Conf, Remote Sens Explor Geol Reno, Nevada
- von Bandat HF (1983) Aerogeology. Gulf Publ, Houston, Texas, pp 70-85
- Walker AS (1986) Eolian landforms. In: Short NM, Blair RW Jr (eds) Geomorphology from space. NASA SP-486, US Govt Printing Office, Washington, DC, pp 447-520
- Wang F (1990) Fuzzy supervised classification of remote sensing images. IEEE Trans Geosci Remote Sens 28:194-201
- Wang JR, O'Neill PE, Jackson TJ, Engman ET (1983) Multifrequency measurements of the effect of soil moisture, soil texture and surface roughness. IEEE Trans, GE-21, No 1
- Warwick D, Hartopp PG, Viljoen RP (1979) Application of the thermal infrared line scanning technique to engineering geological mapping in South Africa. Q J Eng Geol 12:159-179
- Waters P, Greenbaum D, Smart PL, Osmaston H (1990) Applications of remote sensing to groundwater hydrology. Remote Sens Rev 4(2):223-264
- Watson K (1971) A computer program of thermal modelling for interpretation of infrared images. US Geol Surv Rep PB Washington, DC
- Watson K (1973) Periodic heating of a layer over a semi-infinite half solid. J Geophys Res 78:5904-5910
- Watson K (1975) Geologic applications of thermal infrared images. Proc IEEE 63(1):128-137
- Watson K (1982a) Regional thermal inertia mapping from an experimental satellite. Geophysics 47:1681-1687
- Watson K (1982b) Topographic slope correction for analysis of thermal infrared images. Nat Tech Infor Serv E82-10214
- Watson K, Hummer-Miller S (1981) A simple algorithm to estimate the effective regional atmospheric parameters for thermal inertia mapping. Remote Sens Environ 11:455-462
- Watson K, Hummer-Miller S, Offield T (1982) Geologic thermal inertia mapping using HCMM satellite data. Int Geosci Remote Sens Symp (IGARSS) Munich 1:2.1-2.6
- Watson K, Kruse F, Hummer-Miller S (1990) Thermal infrared exploration in the Carlin Trend, northern Nevada. Geophysics 55:70-79
- Watson K, Rowan LC, Bowers TL, Anton-Pacheco C, Gumiell P, Miller SH (1996) Lithologic analysis from ultispectral thermal infrared data of the alkalic rock complex at Iron Hill, Colorado. Geophysics 61:706-721
- Welch R (1980) Measurements from linear array camera images. Photogramm Eng Remote Sens 46:315-318
- Welch R (1983) Impact of geometry on height measurements from MLA digital image data. Photogramm Eng Remote Sens 49:1437-1441
- Welch R, Ehlers M (1987) Merging multiresolution SPOT HRV and Landsat TM data. Photogramm Eng Remote Sens 53(3):301-303
- Welch R, Marko W (1981) Cartographic potential of spacecraft line array camera system: Stereosat. Photogramm Eng Remote Sens 47:1173-1185
- Wharton Se, Irons JR, Huegel F (1981) LAPR: an experimental pushbroom scanner. Photogramm Eng Remote Sens 47:631-639
- Whitney GG, Abrams MJ, Goetz AFH (1983) Mineral discrimination using a portable ratio-determining radiometer. Econ Geol 78:688-698
- Wieczorek GF (1984) Preparing a detailed landslide-inventory map for hazard evaluation and reduction. Bull Assoc Eng Geol 21(3):337-342

- Williams RS Jr (1986) Glaciers and glacial landforms. In: short NM, Blair RW Jr (eds) Geomorphology from space. NASA SP-486, US Govt Printing Office, Washington, DC, pp 521-596
- Williams RS Jr, Southworth CS (1984) Remote sensing makes important gains. *Geotimes* 8:13-15
- Windeler DS, Lyon RJP (1991) Discriminating dolomitization of marble in the ludwig scarn near Yerington, Nevada, using high-resolution airborne infrared imagery. *Photogramm Eng Remote Sens* 57:1171-1178
- Wise DU (1982) Linesmanship and practice of linear geo-art. *Geol Soc Am Bull* 93:886-888
- Woldai T (1983) Lop-Nur (China) studied from Landsat and SIR-A imagery. *J ITC* (1983-3):253-257
- Wolf PR (1983) Elements of photogrammetry. 2<sup>nd</sup> edn, McGraw-Hill, New York
- Woodcock CE, Strahler AH (1987) The factor of scale in Remote sensing. *Remote Sens Environ* 21:311-332
- Woodham RJ (1989) Determining intrinsic surface reflectance in rugged terrain and changing illumination. Proc Int Geosci Remote Sens symp (IGARSS89), Vancouver, British Columbia, Canada, 10-14 July 1989, New York: IEEE Press, vol 1, 1-5
- Wyszecki G, Stiles WS (1967) Color science. Wiley, New York
- Yang H, Zhang J, Van Der Meer F, Kroonenberg SB (1999) Spectral characteristics of wheat associated with hydrocarbon microseepages. *Int J Remote Sens* 20(4):807-813
- Yang H, Meer FVD, Zhang J, Kroonenberg SB (2000) Direct detection of onshore hydrocarbon microseepages by remote sensing techniques. *Remote Sens Rev* 18:1-18
- Yash Pal, Sahai B, Sood RK, Agrawal DP (1980) Remote sensing of the 'lost' Saraswati river. *Proc Ind Acad Sci (Earth Planet Sci)* 89(3):317-331
- Zebker HA, Goldstein RM (1986) Topographic mapping from interferometry synthetic aperture radar observations. *J Geophys Res* 91(B5):4993-4999
- Zebker HA, van Zyl JJ, Held DN (1987) Imaging Polarimetry From Wave Synthesis. *J Geophys Res* 92 (B1):683-701
- Zebker HA, Werner CL, Rosen PA, Hensley S, (1994) Mapping the World's Topography with Radar Interferometry. *Proc IEEE* 82(12): 1774-1786
- Zernitz ER (1932) Drainage patterns and their significance. *J Geol* 40:498-521
- Zhang XM (1998) Coal Fires in North China- detection, monitoring and prediction using remote sensing data. *ITC Publ No 58*, 133p
- Zhou Z, Civco DL, Silander JA (1998) A wavelet transform method to merge Landsat TM and SPOT panchromatic data. *Int J Remote Sensing* 19:743-757
- Zobrist AL, Blackwell RJ, Stromberg WD (1979) Integration of Landsat, Seasat and other geo-data sources. Proc 13<sup>th</sup> Int Symp Remote Sens Environ, Ann Arbor, MI, pp 271-279
- Zobrist AL, Bryant NA, McLeod RG (1983) Technology for large digital mosaics of Landsat data. *Photogramm Eng Remote Sens* 49:1325-1335