

RESUMÉ

Sheikh Rafi Ahmad, D Phil (Oxon)

Address: 15 Vicarage Lane, Shrivenham, Swindon, Wilts. SN6 8DT
Tel:440)179382394(Res).e.:mial: s.r.ahmad@cranfield.ac.uk.

Nationality: British
Date of Birth: 4 February 1944; Gender: Male
Marital Status: Married (3 children)
Home Address:

Personal Profile

Dr Ahmad is a retired scientist and academic with over 40 years of experience in basic and applied research. Over the years he had conceived new ideas and implemented innovative methodologies to validate these for technology development. He has gained expertise in scientific administration and supervision of both basic and applied research and in the management of many national, international and European research projects. He has an excellent track record for full-life project management – including conceiving ideas, writing proposals, creating consortia consisting of relevant people from various organizations, getting grants for various projects, leading projects to successful conclusions and providing deliverables in time. He established and led the Laser Environmental Research Unit within the (then Royal Military College of Science) and later founded the **Centre of Applied Laser Spectroscopy (CALS)** within the Cranfield University and has been leading it since 1988. He had concluded many cutting edge research projects funded by prestigious bodies including European Union (CORDIS). For examples: LIBS for Water Analysis-CT2002-30029 within CRAFT; Jute Modification- CT93-0088 within INCO-DC and Plastic Sorting-CT93-0541 under Brite Euram). The outcomes of such activities are currently being commercialized. He was one of the founder members of the management committee of two major EU scientific network programmes (COST G7- on use of laser for the conservation of cultural heritage and EURO-LASER NET for high-power laser applications. particularly in laser ignition of energetic materials). He was one of the EU's project evaluators within the Marie Curie grant scheme during 2004 and 2005 and initiator and research provider for several EU projects. He supervised many R&D projects funded nationally (including two research contracts from AWE) and internationally on applied research underpinned by basic research **through PhD studentships (12)**. He was on the editorial board of two major international journals and authored 62 peer-reviewed publications in scientific journal and had **published two major books** on environmental monitoring and laser ignition of energetic materials. He was an honorary chief scientist and professor of the Centre of Excellence within the Dhaka University.

Academic Qualifications

D Phil (Laser Physics), University of Oxford, UK, 1972
MSc (Physics), University of Dhaka, Bangladesh, 1966
BSc (Honours), University of Dhaka, Bangladesh, 1964
Intermediate Science, Notre Dame College, Dhaka, Bangladesh, 1961

Matriculation, Kathiadi High School, Bangladesh, 1959

Professional Career

Sept. 1998 – 2014	Head, CALS, DEOS, Cranfield University.
Sept. 1994 – Nov. 1998	Head, Laser Env. Res. Unit, APEO, CU
Aug., 1984 – Sept. 1994	Sen. Res. Officer, Cranfield University (RMCS)
July, 1974 - July 1984	Higher Scientific Officer, RMCS (MoD)
April 1972 - July 1974	Graduate Demonstrator, RMCS (MoD)
Sept 1971 - March 1972	Research Fellow, Dept Eng S., Univ of Oxford
Sept 1967 – Aug. 1971	Res. studentship, Dept Eng Sc., Univ of Oxford
Sept 1966 – Aug. 1967	Sc. Officer, Atomic Energy Centre (Bangladesh)

Memberships and Affiliations

- Scientific editorial board - *Journal of Opto-electronics and Advanced Materials (Romanian)*
- Guest Editor – *Sensor Review (Vol. 19) MCB University Press*
- Editorial advisory board, *Sensor Review (Int. J of Sensor for Industry)*
- Steering committee, - *Cranfield Centre for Sensor Technology and Application*
- UK representative, *EUREKA- EuroLaser-CleanArt, (UK-expert),*
- *EUROLASNET and EE/CCOST G7-Action Group (Co-ordinator of working group3- Env. Monitoring)*
- *Board of advisors, Asia-Europe Env. Tech, Centre (Philippines).*
- *(Ex) member of the board of directors, ECOM Technology, UK.*
- *Life member – Bangla Academy, Dhaka, Bangladesh.*

R&D Projects

1. 'Laser induced breakdown spectroscopy for elemental analysis in water and soil'

Sponsor: Technical authority-aqueous discharge, (re. Mr Alan Benn).
Contract no. AWE- CDK 0553 (CU - ZEE10339E).

2. 'Ignition initiation of Energetic materials bu lasers'.

Sponsor: AWE (re. Dr Peter Golding)
Contract no. AWE - CDK 0553 (CU - ZEE30618V).

3. 'Initiation of shock tube by directed energy from laser diodes'

Sponsor: Chemring (BDL) System Ltd (re. Mr Steve Minns)
Contract no. 017/FY1 (CU - ZEE30963V).

4. 'Laser ignition of HNS'

Sponsor: Chemring energetics UK Ltd, Corsham (re> Mr Mike West).
Purchase order no. 004/FY1 (CU - EEZ10317E)

5. 'Design and development of optical reader for tracer doped plastic identification'

Sponsor: TT Ltd. Paris, France (r. Mr Jean Michel Hachin).

Reviewed Papers

1. S R Ahmad and N S Islam, "Rigidity Dependence and Associated Diurnal Variation of the Nucleonic component of the Cosmic Radiation", Proceedings of the Pakistan Academy of Sciences, **4(1)**, 23-26 (1966)
2. S R Ahmad and D Walsh, "Optical Nonlinearity in CdS at High Photon Densities", J of Appl. Phys. (D), **4**, 1820-1823 (1971).
3. S R Ahmad and D Walsh, "Photoelectric Emission from Metal Surfaces", J of Appl. Phys.(D), **5**, 1157-1159 (1972).
4. S R Ahmad, "Evidence for the Reverse Photoelectrons in Laser-Induced Currents", (American) J of Appl Phys, **43 (1)**, 244-236 (1972).
5. S R Ahmad and A Charlesby, "Broad Line NMR Studies of Linear and Branched Polyethylene", Euro Poly Jrnl, **11**, 91-85, (1975).
6. S R Ahmad and A Charlesby, "Investigation of the Effect of $^{60}\text{Co-}\gamma$ Radiation on Single and Poly-Crystalline Polyethylene by Broad Line NMR", Int J for Rad Phys and Chem, **8**, 497-501 (1976).
7. S R Ahmad and A Charlesby, "Effect of $^{60}\text{Co-}\gamma$ Radiation on the Melting Behaviour Single and Poly-Crystalline Polyethylene", Int J for Rad Phys and Chem. **8(5)**, 585-588 (1976).
8. S R Ahmad and A Charlesby, "Effect of $^{60}\text{Co-}\gamma$ Radiation on the Crystalline Properties of Normal High Paraffins", Int J for Rad Phys and Chem, **11(1)**, 29-33 (1978).
9. S R Ahmad, B J Bridges and A Charlesby, "Destruction of Crystallinity in n-Paraffin by Radiation", Int J for Rad Phys and Chem, **16**, 469-474 (1980).
10. S R Ahmad, "UV-Laser Induced Fluorescence in High Density Polyethylene", J. of Appl. Phys.(D), **6**, L137-L144 (1983).
11. S R Ahmad, "Photodecomposition and Characterization of Polymers by UV-Laser Interaction", J of Appl Phys (D), **20**, 1315-1317 (1987).
12. S R Ahmad, "Application of Raman Scattering in Remote Sensing", Vibrational Spectra and Structure, Elsevier (Pub), **17B**, 369-391 (1989).
13. S R Ahmad and E M Billiet, "Studies on the Weathering Process in Poly(Vinyl Chloride) by Laser-Induced Fluorescence Spectroscopy", Polym Degrad and Stab, **27**,99-106 (1990).
14. S R Ahmad, "On the Uniformity of Optical Modifications in Bulk Polymers", Polym Degrad and Stab, **29**, 201-204 (1990).
15. S R Ahmad and E M Billiet, "Implications of Atmospheric Attenuation in Raman Lidar Detection of Pollutants", Optics and Laser Technology, **23 (3)**, 180-188 (1991).
16. S R Ahmad, "Remote Sensing of Water Pollution by Lasers", Trans Ints M&C **13 (2)**, 104-110 (1991).
17. S R Ahmad, "Applications of Laser Scattering for the Remote Detection of Water Pollutants", Trans M&C, **23**, 299-302 (1991).
18. S R Ahmad and E M Billiet, "Performance Evaluation of a Laboratory-Based Raman Lidar", Optics & Laser Technology, **26(5)**, 323-331 (1994).
19. S R Ahmad and D M Reynolds, "Synchronous Fluorescence Spectroscopy of Waste Water", IAWQ, Wat Res **29(6)**, 1599-1602 (1995).
20. D M Reynolds and S R Ahmad, "The Effect of Metal Ions on the Fluorescence Properties of Sewage Waste Water", Wat. Res. **29 (9)**, 2214-2216 (1995).
21. F Khan and S R Ahmad, "Chemical Modification and spectroscopic Analysis of Jute", Poly. Deg. & Stab. (UK), **52**,335-340,(1996).
22. D M Reynolds and S R Ahmad, "Rapid Determination of Biochemical Oxygen Demand Values of Wastewater using Fluorescence Technique, Water Research, **31(8)**,2012-2018,(1997).

23. S R Ahmad and V G Foster , “ Local Field Effect in Raman Scattering “, J. of Phys. D: Appl. Phys. **30(19)**,2677-2685, (1997).
24. F Khan and S R Ahmad, “Graft Copolymerization of Water-Emulsified Monomer with Pre-irradiated Jute Fibre “, J. of Appl. Poly. Sc. **65**,459-468,(1997).
25. D M Reynolds and S R Ahmad, “Correlation between Absorbance and Fluorescence of Wastewaters from various Locations “, Int. Env. Tech. **7(3)**, 17-19, (1997).
26. S R Ahmad and V G Foster, “Raman Cross-section De-enhancement Phenomenon in the Excitation Profile of the 1347 cm^{-1} Mode of Nitrobenzene “, J. of Applied Spectroscopy, **52(1)** 51-57, (1998).
27. D M Reynolds, R A Fenner, A Iles, S R Ahmad and M Tominaga, “Noninvasive Optical Sensing for Real-time, Continuous Monitoring of Water and Wastewater Quality”, Int.Env. Tech., **8(1)**, 26-28, (1998).
28. S R Ahmad, C Rogge and E Billiet, “Design and Development of a Fluorosensor for the Automatic Identification of Tracer-doped Plastics”, Measurement and Control **33(9)**,341-344,(1999).
29. A S M Khan, E Kronfli and S R Ahmad, “Stability of Jute Fibres on Exposure to Ionizing Radiation”, Poly.Degr. and Stab, **63**,79-84,(1999).
30. S R Ahmad and D Reynolds, “ Monitoring of Water Quality using Fluorescence Technique - Prospect of on-line Process Control “, Water Research, **33(9)**,2069-2074,(1999).
31. S Rafi Ahmad, C Rogge and E Billiet, “A Fluorescence Tracer Based System for Automatic Identification of Doped Plastics in a Mixed Waste stream”, Measurement and Control, **32(2)**,50-52(1999).
32. S Rafi Ahmad, “ Marking of Products with Fluorescent Tracers in Binary Combinations for Automatic Identification and Sorting”, Int. J.Assembly Tech. & Management (ISSN 0144-5154), **20(1)**,58-64,2000.
33. S Rafi Ahmad and V G Foster, “Pre-resonance Raman Scattering in Nitrobenzene Vapour”, J. Raman Spect. **31(11)**, 20-26,2000
34. C Rogge and S Rafi Ahmad, “Photophysical Properties of a Quinoline Derivative in Polymer Matrices”, J,Opt-elct.&Advanced Materials,**2(3)**.247-254, 2000
35. S R Ahmad and A Iles, “Raman Excitation Profile of the 3400 cm^{-1} Mode of Liquid Water”, J. Raman Spect. **32**,649-655, 2001.
36. S R Ahmad, D A Russell and C Leach,” Studies on Laser Ignition of Unconfined Propellants”, Propellants, Explosives and Pyrotechnics”, **26**, 1-11, 2001.
37. F Khan, S R Ahmad and E Kronfli, “Gamma Radiation Induced Emulsion Graft Copolymerization of MMA onto Jute Fiber”, J. of Poly. Sc., **21(2)**, 4-10, 2002.
38. F Khan, S R Ahmad and E Kronfli, “Thermal and surface characterization of lignosilulose-graft PMMA copolymer initiated by gama radiation”, appl. Polym. Sc., **91**, 1667-1675, 2004.
39. S Rafi Ahmad, A new technology for automatic identification and sorting of plastics for recycling”, Environmental Technology, **25**, 1143-1149, 2004.
40. F Khan, S R Ahmad and E Kronfli, “UV-radiation-induced preirradiation grafting of methyl methacrylate onto lignocellulose fibre in an aqueous medium and characterization”, J. of Appl. Polym. Sc. **91**, 1667-1675, 2004.
42. A M Keszler, L Nemes, S Rafi Ahmad, X Fang, “ Characterisation of carbon nanotube materials by Raman spectroscopy and microscopy – a case study of multi-walled and single walled samples”, J. of Optoelectronics and Advanced Materials, **6(4)**,1269 – 1274, 2004.
43. S R Ahmad and D A Russell, “Laser ignition of pyrotechnics – effect of wavelength, composition and confinement”, Propellants, explosives, pyrotechnics, **30(2)**, 131-139, 2005.
44. X Fang and S.R. Ahmad, “An Optical Technique for In Situ monitoring of Trace Metals in Effluent”, Environmental Technology, **26(11)**, 1271-1277, 2005.
45. X Fang, S Rafi Ahmad, M Mayo, S Iqbal, “Elemental Analysis of Urinary Calculi by Laser Induced Plasma Spectroscopy”, Lasers in Medical Science, **20**, 132-137, 2005.

46. F Khan, S R Ahmad, E Kronfli, "γ-Radiation Induced Changes in Physical and Chemical Properties of Lignocellulose", *Biomolecules*, **7**,2303-2309,2006.
47. F Khan and S R Ahmad, "Graft Copolymerization and Characterization of 2-hydroxyethyl methacrylate on to jute fibres by Photo irradiation", *J of Appl. Pol. Sc.* **101**, 2898 – 2910, 2006.
48. X Fang and S R Ahmad, "Saturation effect at high laser pulse energies in laser-induced breakdown spectroscopy for elemental analysis in water", *Laser and Particle Beams*, **25**, 1-8, 2007.
49. S M Ferdous Khan, Azfar Ali Syed, S R Ahmad, "Nanotube composites produced from single-walled carbon nanotubes and polycarbonates", *Opto-electronics and advanced Materials*, 1(7), 344-347, 2007.
50. X Fang and S R Ahmad, "Sample presentation considerations for laser induced breakdown spectroscopy for elemental detection in water" *Appl. Spect.* **61(9)**, 1021-1024, 2007.
51. F Khan, D Kwek, E Kronfli and S R Ahmad, "Laser-Induced Crosslinking of Ultra-Low and High-Density Polyethylene", *Macromol. Rapid Commun. (Willy In. Sc.)* **28**,158-163, 2007.
52. F Khan, D Kwek, E Kronfli and S R Ahmad, "Cross-linking of ethyl-propylene (-diene) terpolymer elastomer initiated by an excimer laser", *Poly. Deg. & Stab.*, 92(8), 1640-1644, 2007.
53. Ahmad, S. Rafi, Bellerby, J. M., **Use of** metal nano-structured substrates for ultra-sensitive detections. *G.I.T. Laboratory Journal, Europe* (**11**), 24-25. 2007,
54. F Khan, D Kwek, E Kronfli, S R Ahmad, "Photochemical crosslinking of ethylene-vinyl-acetate and ethylene-propylene-diene Terpolymer blends", *polym. deg. and Stab.*, **93**, 1238-1241,2008.
55. S R Ahmad, D A Russell, "Studies into Laser Ignition of Confined Pyrotechnic", *Propellants, Explosives and Pyrotechnics*, **33**,396-402, 2008.
56. X Fang and S R Ahmad, "Detection of explosive vapour using surface-enhanced Raman spectroscopy", *Appl. Phys. B*, **97(3)**, 723-726, 2009.
57. S R Ahmad, D A Russell and P Golding, "Laser-Induced Deflagration of Unconfined HMX – The Effect of Energetic Binders", *Propellants Explosives. Pyrotechnics.* **34**, 513 – 519, 2009.
58. S R Ahmad et al. "Laser Ignition of GUDN – Facilitation by n Energetic Polypuophazene", 36th Int.Pyrotechnics seminar, Rotterdam, The Netherlands,m24-28bbAug. 2009.
59. C S Peel, X Fang, S R Ahmad, "Dynamics of Laser-Induced Cavitation in Liquid", *Appl. Phys.A*, DOI 10.1007/s00339-010-6056-7, 2010.
60. E Burke, X Fang, S R Ahmad and M West, " Effect of Dopant on laser Ignition Sensitivity of Hexanitrostilbene Type IV",
61. X Fang, S Rafi Ahmad, "Detection of mercury in water by laser induced breakdown spectroscopy with sample pre-concentration",
62. F Khan and S R Ahmad, "Polysaccharides and their derivatives for versatile tissue engineering application". *Mac. Mol. Bio Sc.* 10.100 2013.
63. F Khan, M Tanaka and S R Ahmad, "Fabrication of polymeric biomaterials: a strategy for tissue engineering and medical devices", *J of Material Chemistry B*, 3, 8224-8249, 2015.
64. X Fang and S R Ahmad, "Laser Ignition of an Optically Sensitised Secondary Explosive by a Diode Laser" *Central European Journal of Energetic Materials*, 13(1), 103-115, 2016.

Invited Papers

1. S R Ahmad, "Application of Lidar to Atmosphere Pollution Mapping: A Review", (Invited Paper), *Proc. SPIE (A J Sedlacek III ed.)*, 3127,1-13,(1997).

2. S R Ahmad, "Monitoring of Wastewater Quality using Fluorescence Technique", Int. Con. Environment-Asia (Singapore), Nov. 1997.
3. S R Ahmad, "Design and Development of a Fluoro-sensor for Automatic Identification and Sorting of Tracer doped Plastics", Int. Con. Nvironmex Asia (Singapore), Nov. 1997.
4. S R Ahmad, "Laser Ignition of Energetic Materials using a Low Power Diode Laser", Proc. Seminar on Appl. Of lasers in material Processing", Jadabpur, Univ of Kolkata. India. Feb. 3-4, 2006
5. S R Ahmad, "Evaluation of SERS for Explosive Detection", Univ. of Lincoln, UK, Forensic Analysis. 2-4 Sept. 2007,

Book reviews

1. **Frontiers in Laser Spectroscopy**, T W Hansch and M Inguscio (Eds.), Optics and Laser Technology, 28(7),p-x (1996).
2. **Fingerprint Detection with Lasers** (2nd edition), E R Menzel (au.),Optics and Lasers in Engineering, ISSN:0143-8166, 32(2),pp.175-176, 1999.
3. **Applications of High-Field and Short Wavelength Sources**, L DiMauro, M Murnane and A L Huillier (eds.). Optics and Laser Technology,31,401-402,1999
4. **Optical Materials**, J H Simmons and K S Potter, Optics and Lasers in Engineering, (Elsevier Sc, Ltd. Pub.), 35 (2), pp. 131-133, 2001.

Authorship of Books

1. S R Ahmad and M Cartwright, "Laser Ignition of Energetic Materials, J Willy & Sons Ltd. ISBN 978-0-470-97598-5, 2015.
2. S R Ahmad, M Cartwright and F Taylor, "**Analytical Methods for Environmental Monitoring**", Pearson Education Ltd. (pub), , ISBN no. 0582-25357-8, 2001
3. S R Ahmad, "**Laser Ray**", A Reference Book for Undergraduates, pp-315, Bangla Academy, Dhaka(Pub.); 1982.

Major Reports

1. S R Ahmad, "Optical Remote Sensing of Atmospheric Trace Contaminants", a feasibility study, RMCS Report pp-24, (June 1984).
2. S R Ahmad and B Simmons, "Identification and Separation of Plastics in Mixed Waste", Final technical report to the EEC, Contract No. BE-7148, 1997.
3. S R Ahmad and E Kronfli, "Characterization and Modification of Jute Fibres", Final report, CEC Contract no. CT93-0088, (1998).
4. S R Ahmad, "Feasibility Study on Laser Ignition of Propellants", Final report, DERA/05-00, May 2000.
5. S R Ahmad, "An investigation into the use of laser energy to obtain direct pyrotechnic ignition in rocket motors", PO: T116104. June 2001.

Patents

1. Identifiable Substances, British Patent Application No. 9722031.3; Cranfield University (S R Ahmad), Pira International (B Simmons) and Laboratoir National d'Essais,France (C Lambert): filing date- 17 Oct.1997.
2. Optical Sensor System, British Patent Application No. 9722032.1; Cranfield University (S R Ahmad, E M Billiet and C Rogge), filing date-17 Oct. 1997.
3. A Method of achieving low order detonation in NiHN by diode laser, British patent application no. GB0708297.7, Filing date: 28/04.2007.