

BIO-DATA of Dr Subhasis Das

1. Name : Dr Subhasis Das
2. Present designation : Associate Professor
3. Institution : The University of Burdwan
Department of Physics,
Burdwan 713 104, India
4. Date of Joining as a Lecturer : 16.09.1995
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Department of Physics
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7. Date of Birth : 29th February 1960
8. Marital Status : Married
9. Nationality : Indian
10. Area of Specialisation : Laser Physics and Nonlinear Optics
(Experimental)
11. Total No. of Publications : 57
International journal : 54
National Journal : 03
Conference publication : 25
12. Editorship of journal: **Member** of the Editorial board of International
Journal of Physics and Mathematical Sciences
13. Membership of professional body: (i) Life member of India Laser Association
(ii) Life member of Indian Association of
Cultivation of Science
14. Ph.D student supervised : one
15. Current Ph.D student supervised : nil

16. Academic Qualification:

Examination	Council/Board University	Year of Passing	Division/Class	% of marks	Subject
Madhyamik	W.B. Board of Secondary Edn.	1976	1 st division	64.6	BBES(M)
Higher Secondary	W.B. Council of H.S. Education	1978	2 nd division	54.7	Beng, Eng, Phy, Chem, Math
B. Sc	Burdwan Univ.	1982	2 nd class	58.0	Physics (Hons)
M. Sc	Burdwan Univ.	1985	1 st class	64.0	Physics (Electronics)
NET	UGC	1985	-	-	Physics
Ph.D.	Burdwan University	1990	Supervisor: Prof G C Bhar		Nonlinear Optics (Expt.)
Thesis entitled: " On some techniques of nonlinear optical laser devices " Nobel laureate Prof N Bloembergen was one my thesis examiners					

N.B. Though our M.Sc session was 1981-83, but due to session lag our M.Sc. final examination was held in March-Apr.1985 and received the final result in Oct. 1985.

17. Academic & Research Experience Profile :

Name of the Employer	Period of Service	Designation	Duty
Burdwan University	15.10.85 to 10.04.90	Research Scholar.	Research
Burdwan University	11.04.90 to 26.09.94	Research Officer (in Defence Project)	Research
C S I R (at Burdwan University)	27.09.94 to 15.09.95	Pool Officer	Research
Burdwan University	16.09.95 to 15.09.99	Lecturer	Teaching & Research
Burdwan University	16.09.99 to 15.09.04	Sr. Lecturer	-do-
Burdwan University	16.09.04 to 15.09.07	Reader	-do-
Burdwan University	16.09.07 to ongoing	Associate professor	-do-

18. Fellowship/Scholarship received for Post Doctoral Research :

Name of the Fellowship	Awarding Agency	Place of Research	Duration	Achievement
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Commonwealth Fellowship	Association for Commonwealth Universities, London; U.K.	Univ. of St. Andrews, St. Andrews, Scotland Host Scientist: Prof Majid Ebrahimzadeh	Oct. 1999 to Sept. 2000	During this period one singly resonant OPO in 3-5 μm spectral range was developed pumped by Ti:Sapphire laser based on PPLN crystal.
Associateship (Jr.)	ICTP, Trieste, Italy		1997-2000	
Visiting Scientist	DST, Govt of India	Institute of Monitoring of Climate and Ecological system, Tomsk, Russia	Sept. 28 to Oct. 26, 2003	to carry out joint collaborative research under ILTP between India and Russia in Science & Technology

19. Training:

Programme	Institute	Duration	Sponsor	Remarks
“Third training college on Physics and Technology of Lasers and Fibre-optics”	ICTP, Trieste, Italy	Jan. 27 to March 6, 1992	ICTP, Trieste, Italy	ICTP bears the round trip air-fare and the maintenance cost during my stay there

20. Research Project handled:

Sl. No.	Title of the Project Scheme	Name of the funding agency	Sanctioned Amount	Date of initiation and duration	Remarks
1.	Generation of tunable coherent radiation covering 16 μm by nonlinear optical frequency mixing techniques	Board of Research in Nuclear Sciences (BRNS) Department of Atomic Energy, Govt. of India	Rs. 15.78 lacs	Date of implementation: 16.08.2001 Date of Completion: 31.03.2004	Principal Investigator
2.	Design, optimization and validation of a narrow linewidth tunable optical parametric oscillator in 2-5 μm region	Laser Science and Technology Centre (LASTEC), Ministry of Defence, Govt. of India	Rs.18.75 lacs	Date of Implementation: Jan. 25, 2006 completed	Principal Investigator
3	Generation of middle infrared coherent radiation by cascaded optical parametric oscillation technique.	Defence Research & Development Organisation, Govt. of India	Rs.44.00 lacs	Date of Implementation: March 9, 2011 ongoing	

Remark: In BRNS project I developed a singly resonant optical parametric oscillator pumped by 1.064 micron radiation from Nd:YAG laser in KTA crystal which was first OPO in infrared spectral range in India.

In the 2nd research project I have improved above-mentioned OPO incorporating a grating in the cavity, thereby it is providing narrow line-width, tunable laser radiation in the spectral range 3-5 micron

21. Research Guidance:

Registered for	Name of the students supervised	Title of the work/Thesis	Remarks
Ph.D	Chittaranjan Ghosh	Studies on development of tunable laser sources based on optical parametric processes and some application	Degree awarded

22. Innovations made/patents taken:

I did not applied for any patent but some Companies e.g...M/S Inrad Inc of USA, M/S EKSPLA of Lithuania marketed their product cited my characterisation research work.

23. Additional Information :

- (i) The Abdus Salam International Centre for Theoretical Physics, Trieste, Italy **on my application** (on their prescribed format) has sanctioned **TWO total travel grants** under their “**Visiting Scholar**” programme and Two Russian scientists (i) Prof V G Voevodin of Siberian Physico Technical Institute, Tomsk, and (ii) Prof Yu M Andreev of Institute of Climate and Monitoring for Ecological Systems, Tomsk, visited our laboratory at Burdwan University to carry out collaborative research work during April 2003 and March 2005 respectively.
- (ii) Selected for a Japanese Government Scholarship (as a reserved candidate) in 1992.
- (iii) Department of Science & Technology, Government of India sanctioned me round trip air-fare to participate and present my research work at the “91’International Workshop on Laser and Laser Applications” held at Shanghai Institute of Optics and Fine Mechanics, **Shanghai, China** from Nov. 4-16, 1991. The Organiser borne the local hospitality and waive the conference registration fee.
- (iv) **Recipient National Loan Scholarship**

24. Research Experience in Brief:

After passing M.Sc examination in 1985 I was selected and joined as a research scholar in October 1985 in the Laser Laboratory of the Physics Department of this University under the supervision of **Prof G C Bhar**. I completed my Ph.D thesis work in 1989 and got my Ph.D degree in June 1990. After that I was associated with this laboratory as a Post-doctoral fellow (upto Sept. 1995) and now I am associated with this laboratory as a faculty member.

My research work concentrated mainly with the characterisation of various nonlinear crystals specially to mention are infrared chalcopyrite crystals like AgGaS_2 , AgGaSe_2 , ZnGeP_2 , mixed chalcopyrite $\text{AgGa}_{(x)}\text{In}_{(1-x)}\text{Se}_2$, GaSe , HgGa_2S_4 , $\text{Ag}_x\text{Ga}_x\text{Ge}_{(1-x)}\text{S}_4$ ($x=0.5$) for laser device applications. The characterisation includes measurement of optical properties; such as transmission, absorption, refractive indices etc. and device applications. The later category includes second harmonic generation, infrared detection by optical upconversion and generation of tunable lasers in the ultraviolet and infrared by sum-frequency mixing, difference frequency mixing, optical parametric oscillation using Nd:YAG, Dye, CO_2 and Ti:sapphire lasers. Currently my research interest is the development of tunable source by **Optical Parametric Oscillation for different applications**. During this period research work done so far in this field is stated below in brief:

- (i) Developed a singly resonant, grating tunable, narrow line-width, optical parametric oscillator in 3-5 μm spectral range pumped by Q-switched Nd:YAG laser
- (ii) Development of a singly resonant, synchronous pump, low-pump-threshold, high-repetition-rate optical parametric oscillator for the mid-infrared (4-6 μm) based on PPLN crystal pumped by a Ti:sapphire laser.
- (iii) On noncritical phase matched infrared laser devices and applications.
- (iv) Generation of tunable UV radiation below 247 nm by SHG, SFG in BBO, LAP crystals
- (v) Generation of tunable NIR upto 5.1 micron by DFG in BBO & KTA crystals
- (vi) Development of a technique of prediction of phase matching angle in noncollinear geometry involving two 'e' rays.
- (vii) Development of a system for detection of weak infrared radiation (10 μm) by upconversion technique

- (viii) Temperature tunable infrared generation by second harmonic of CO₂ laser radiation
- (ix) Efficient second harmonic generator of CO₂ laser radiation
- (x) Demonstration of generation of tunable radiation from 5 to 16 μm by DFG technique in GaSe crystal.
- (xi) Developed a simple technique for enhance of conversion efficiency in optical frequency mixing processes by focusing using cylindrical lens.

List of Publications
of
Dr Subhasis Das
Physics Department, Burdwan University, Burdwan-713 104, India

1. *Crystal Engg. Communication* 15, 2127–2132 (2013)
“Single crystal growth of ninhydrin by unidirectional Sankaranarayanan- Ramasamy (SR) method by using glass ampoule for nonlinear optical applications”
– N Rani, N Vijayan, B Riscob, S karan Jat, A Krishna, **S Das**, G Bhagavannarayana, B Rathi and M A Wahab
2. *Japanese Journal of Applied Physics* 51 (10) (2012)
“Tunable middle infrared radiation with CdGeAs₂ crystal”
– S Das
3. *Quantum Electronics* 42, (3) 228–230 (1012)
“Tunable mid-IR radiation by second harmonic generation in a CdGeAs₂ crystal”
– S Das
4. *Optical Material* 35, 307–309 (2012)
“Investigation on second and third order nonlinear optical, phase matching and birefringence properties of γ -glycine single crystals”
– G. Peramaiyan, P. Pandi, V. Jayaramakrishnan, **S Das** and R. Mohan Kumar
5. *Spectrochimica Acta Part A* 93, 75–80 (2012)
“Optical, elemental and structural analyses of acetoacetanilide single crystals for nonlinear optical applications”
N. Vijayan, G. Bhagavannarayana, K.K. Maurya, J. Jayabharathi, D. Haranath and **S Das**
6. *Pramana-J of Physics* 75, 827 (2010)
“Narrow line-width pulsed optical parametric oscillator”
– S Das
7. *Nonlinear Opt., Quan. Opt.* 41, 137 (2010)
“Singly resonant optical parametric oscillator in middle-infrared based on KTA crystal”
– S Das
8. *IEEE J Quan Electronics* 45 (9) 1100 (2009)
“Line tunable singly resonant optical parametric oscillator in mid-infrared spectral range based on KTA crystal”
– S Das
9. *Journal of Physics D: Applied Physics* 42, 085107 (2009)
“Nd:YAG pumped tunable singly resonant optical parametric oscillator in mid-infrared”
– S Das

10. *J Materials Science* **44**, 3457 (2009)
“Synthesis, growth and structural perfection of nonlinear optical material of glycine hydrofluoride (GHF)”
- N. Vijayan, G. Bhagavannarayana, S.N. Sharma and **S Das**
11. *Applied Physics Letters* **91**, 141109 (2007)
“A simple technique of enhancement of efficiency in optical frequency conversion”
- **S Das**, C Ghosh and S Gangopadhyay
12. *Materials Letters* **62**, 1252–1254 (2008)
“Optical, dielectric and surface studies on solution grown benzimidazole single crystals”
N. Vijayan, G. Bhagavannarayana, G.C. Budakoti, B. Kumar, V. Upadhyaya and **S Das**
13. *Infrared Physics and Technology* **51**, 9–12 (2007)
“A comparative study of second harmonic generation of pulsed CO₂ laser radiation in some infrared crystals”
- **S Das**, C Ghosh and S Gangopadhyay
14. *Japanese Journal of Applied Physics* **45**(7) 5795–5797, *ibid* **45**(11) 9000 (2006)
“AgGaGeS₄ Crystals for Nonlinear Laser Device Applications”
- **S Das**, C Ghosh, S Gangopadhyay, Yu M Andreev and V V Badikov
15. *Journal of Optical Society of America B* **29**, 282–288 (2006)
“Tunable coherent infrared source from 5-16 μm based on difference frequency mixing in indium doped GaSe crystal”
- **S Das**, C Ghosh, S Gangopadhyay, U Chatterjee, G C Bhar, V G Voevodin and O G Voevodina
16. *Optics Communication* **259**, 868–872, *ibid* **263**, 352 (2006)
“Tunable middle infrared radiation with HgGa₂S₄ crystal”
- **S Das**, U Chatterjee, C Ghosh, S Gangopadhyay, Yu M Andreev, G Lanskii and V V Badikov
17. *Applied Physics B* **82**, 43–46 (2006)
“Modified GaSe crystal as a parametric frequency converter”
- **S Das**, C Ghosh, O G Voevodina and Yu M Andreev
18. *Journal of Applied Spectroscopy* **73** (1), 123–129 (2006)
“Low-limit photo-acoustics detection of solid RDX and TNT explosives with carbon dioxide laser”
- A K Chaudhury, G C Bhar and **S Das**
19. *Applied Optics* **44** (35), 7644–7650 (2005)
“Acceptable composition ratio variations of a mixed crystal for nonlinear laser device applications”
- Jin Jer Huang, Yu M Andreev, G Lanski, A Shaiduka, **S Das** and U Chatterjee
20. *Nonlinear Optics*, *Quan. Opts.* **33**, 119–129 (2005)

- “Tunable mid-infrared radiation by singly-resonant optical parametric oscillation based on KTA crystal”
- **S Das**, C Ghosh, S Gangopadhyay and G C Bhar
21. *Nonlinear Optics , Quan. Opts.* **33**, 41–50 (2005)
“In search of noncritically phase-matched nonlinear infrared laser devices”
- **S Das**, G C Bhar and C Ghosh
22. *Pramana–J of Physics* **64**, 67–74 (2005)
“Singly resonant optical parametric oscillator based on KTA crystal”.
- **S Das**, S Gangopadhyay, C Ghosh and G C Bhar
23. *Applied Optics* **42 (21)**, 4335–4340 (2003)
“Linear and nonlinear optical properties of ZnGeP₂ crystal for infrared laser device applications-Revisited”
- **S Das**, G C Bhar, S Gangopadhyay and C Ghosh
24. *Nonlinear Optics , Quan. Opts.* **29**, 19–27 (2002)
“Nonlinear optical properties of defect tetrahedral crystals HgGa₂S₄ & AgGaGeS₄ and mixed chalcopyrite crystal Cd_(0.4)Hg_(0.6)Ga₂S₄”
- Yu M Andreev, P P Geiko, V V Badikov, G C Bhar, **S Das** and A K Chaudhury
25. *Proc. SPIE, 4900, part 2.*, pp. 885–890 (2002)
“New optical material for tunable coherent infrared source for different applications”
- G C Bhar, **S Das**, Yu M Andreev, P P Geiko and V V Badikov
26. *Proc. SPIE, 4900, part 2.*, pp. 924–928 (2002)
“In Search of Noncritically Phase-matched Infrared Laser Devices”
- G C Bhar and **S Das**
27. *Applied Physics B* **72**, 793–801 (2001)
“Low threshold mid-infrared optical parametric oscillation in periodically-poled LiNbO₃ synchronously pumped by a Ti:sapphire laser”
- M Ebrahimzadeh, P J Phillips and **S Das**
28. *Applied Physics Letters* **77**, 469–471 (2000)
“High repetition-rate all-solid-state Ti:sapphire pumped optical parametric oscillator for the mid-infrared”
- P J Phillips, **S Das** and M Ebrahimzadeh
29. *Japanese Journal of Applied Physics* **38** 2760–2763 (1999)
“Tunable mid-infrared generation by difference frequency mixing in KTiOAsO₄”
- G C Bhar, U Chatterjee, P Kumbhakar and **S Das**
30. *Applied Physics B* **65**, 471–73 (1997)
“Synchronous pulsed infrared detection in AgGaSe₂ crystal using 1.318 □m pump”

- G C Bhar, **S Das**, R K Route and R S Feigelson
31. *Optics Letters* **20**, 2057–59 (1995)
"Efficient generation of mid-infrared radiation in $\text{AgGa}_x\text{In}_{1-x}\text{Se}_2$ crystal"
- G C Bhar, **S Das**, D V Satyanarayan, P K Datta, U Nundy and Yu M Andreev
 32. *Applied Physics B*, **61**, 187–90 (1995)
"Nonlinear optical devices using GaSe"
- G C Bhar, **S Das** and K L Vodopyanov
 33. *Indian Journal of Pure and Applied Physics* **33**, 169–78 (1995)
"A system review of infrared upconversion"
- G C Bhar and **S Das**
 34. *Journal of Physics D: Applied Physics* **27**, 228–30 (1994)
"Tangentially phase-matched upconversion in AgGaS_2 "
- G C Bhar, **S Das** and P K Datta
 35. *Journal of Physics D: Applied Physics* **27**, 231–34 (1994)
"Evaluation of AgGaSe_2 temperature dependent nonlinear devices"
- G C Bhar, **S Das**, U Chatterjee, A M Rudra, R K Route and R S Feigelson
 36. *Applied Physics B* **56**, 327–30 (1993)
"Characterisation of biaxial crystals for tangentially phase-matched frequency conversion"
- G C Bhar, P K Datta, U Chatterjee, **S Das** and H L Bhat
 37. *Applied Physics Letters* **63**, 1316–18 (1993)
"Noncritically phase-matched second harmonic generation in mixed chalcopyrite crystal"
- G C Bhar, **S Das**, U Chatterjee, P K Datta and Yu M Andreev
 38. *Journal of Applied Physics* **74**, 5282–84 (1993)
"Temperature effects in second harmonic generation in AgGaSe_2 "
- G C Bhar, **S Das**, U Chatterjee, A M Rudra, R K Route and R S Feigelson
 39. *Japanese Journal of Applied Physics* Suppl. **32–3**, 120–22 (1993)
"In search for noncritically phase-matched nonlinear devices with chalcopyrite crystals"
- G C Bhar, P K Datta and **S Das**
 40. *Journal of Applied Physics* **71**, 3620–22 (1992)
"Tangentially phase-matched second harmonic generation in various crystals"
- G C Bhar, P K Datta and **S Das**
 41. *Applied Physics Letters* **58**, 231–33 (1991)
"Tunable near infrared radiation by difference frequency mixing in barium borate crystal"
- G C Bhar, U Chatterjee and **S Das**
 42. *Applied Physics B* **53**, 19–22 (1991)

- "Noncritical detection of tunable CO₂ laser radiation into the green by upconversion silver thio-gallate"
- G C Bhar, *S Das*, P K Datta, U Chatterjee, R S Feigelson and R K Route
43. *Optics Communication* **80**, 381–84 (1991)
"A technique of calculation of phase-matching angle for type-II noncollinear sum-frequency generation in negative uniaxial crystals"
- G C Bhar, U Chatterjee and *S Das*
44. *Journal of Physics D: Applied Physics* **23**, 121–22 (1990)
"Temperature effects in ZnGeP₂ nonlinear laser devices"
- G C Bhar, *S Das*, R K Tyagi and V V Rampal
45. *Japanese Journal of Applied Physics* **29**, L1129–29 (1990)
"Generation of tunable ultra-violet/visible radiation by sum-frequency mixing in barium borate"
- G C Bhar, U Chatterjee and *S Das*
46. *Physica Status Solidi (a)* **119** (2), K173–76 (1990)
"Efficient frequency doubling of Nd laser radiation"
- G C Bhar, P K Datta and *S Das*
47. *Applied Physics Letters* **54**, 313–14 (1989)
"Temperature tunable second harmonic generation in ZnGeP₂"
- G C Bhar, *S Das*, U Chatterjee and K L Vodopyanov
48. *Applied Physics Letters* **54**, 1383–84 (1989)
"Noncollinearly phase-matched second harmonic generation in β -BaB₂O₄"
- G C Bhar, *S Das*, and U Chatterjee
49. *Applied Physics Letters* **54**, 1489–91 (1989)
"Synchronous and noncollinear infrared upconversion in AgGaS₂"
- G C Bhar, *S Das*, U Chatterjee, R K Route, R S Feigelson
50. *Journal of Applied Physics* **66**, 5111–13 (1989)
"Noncollinear third harmonic generation and tunable second harmonic generation in barium borate"
- G C Bhar, U Chatterjee and *S Das*
51. *Journal of Physics D: Applied Physics* **22**, 562–63 (1989)
"Second harmonic generation in beta barium borate by orthogonally polarised Nd:YAG laser beams"
- G C Bhar, *S Das* and U Chatterjee
52. *Applied Optics* **28**, 202–04 (1989)
"Evaluation of beta barium borate crystal for nonlinear laser devices"
- G C Bhar, *S Das* and U Chatterjee

53. *Journal of Physics D: Applied Physics* 21, 1301–03 (1988)
"Tunable infrared detection in nonlinear silver thio-gallate"
- G C Bhar and *S Das*
54. *IEEE J. Quantum Electronics* 24, 1492–94 (1988)
"Phase-matching in infrared nonlinear laser devices in AgGaS₂"
- G C Bhar, *S Das*, D K Ghosh and L K Samanta
55. *Infrared Physics* 28, 163–64 (1988)
"A simple technique for separation of laser beams in collinear frequency mixing"
- G C Bhar, N P Ghosh and *S Das*
56. *Infrared Physics* 27, 245–48 (1987)
"Efficient infrared detection by two step upconversion"
- G C Bhar, N P Ghosh and *S Das*
57. *Soviet Journal of Quantum Electronics* 17, 860–61 (1987)
"A tunable parametric ZnGeP₂ crystal oscillator"
- G C Bhar, L K Samanta, D K Ghosh and *S Das*

Proceedings of National/International Conferences, Symposium etc.

1. **Proc. XXXVI symposium of Optical Society of India, IIT Delhi** Dec. 3-5, 2011
"Tunable middle infrared radiation with mercury thiogallate crystal"
- **S Das**

2. Proc. 9th **DAE-BRNS National Laser Symposium, BARC, Mumbai**, Jan. 13-16, 2010
“A technique of enhancement of energy in optical frequency mixing processes”
- **S Das**
3. Proc. 8th **DAE-BRNS National Laser Symposium, LASTEC, New Delhi** Jan. 7-10, 2009
“ A comparative study of second harmonic generation of CO₂ laser radiation”
- **S Das**
4. **Proc. National Conference on Advances in Technologically Important Crystals, Delhi University, Oct. 12-14, 2006** Eds: B Kumar & R P Tandon; Macmillan Publishers; p. 395-398
“Tunable infrared source with doped GaSe crystal”
- **S Das** and C Ghosh
5. **Proc. International Conference on Optics and Opto-electronics, IRDE, DehraDun**, Dec. 12-15, 2007
“A new scheme for large enhancement of conversion efficiency for second harmonic generation”
- U Chatterjee, C Ghosh, S Gangopadhyay and **S Das**
6. Proc. **DAE-BRNS National Laser Symposium, BARC, Mumbai**, Jan. 10-13, 2005
“Tunable mid-infrared source by singly resonant optical parametric oscillation”
- **S Das**, S Gangopadhyay, C Ghosh and G C Bhar
7. Proc. **DAE-BRNS National Laser Symposium, BARC, Mumbai**, Jan. 10-13, 2005
“Generation of tunable ultrafast near-UV laser radiation”
- P Kumbhakar, U Chatterjee, **S Das** and T Kobayashi
8. **Proc DAE-BRNS National Laser Symposium, IIT Kharagpur**, Dec. 22-24 (2003); p. 217
“New optical Materials for Tunable Infrared Source”
- **S Das**, U Chatterjee, G C Bhar, Yu M Andreev and V V Badikov
9. **Proc. International Conference on Fibre Optics and Photonics-Photonics 2004, CUSAT, Kochi, India**, Dec 9-11. 2004
“Singly resonant optical parametric oscillator for mid-infrared”
- S Das, S gangopadhyay, C Ghosh and G C Bhar
10. **Proc. International Conference on Fibre Optics and Photonics-Photonics 2002, TIFR, Mumbai, India**, Dec 15-20. 2002
“Linear and nonlinear properties of ZnGeP₂ crystal for laser device application”
- **S Das**, S B Mandal and G C Bhar
11. **Proc. DAE-BRNS National Laser Symposium, Thiruvananthapuram, India**, Nov 14-16, 2002; p. 495-96
“Nonlinear optical properties of ZnGeP₂ for infrared laser device applications”
- **S Das**, S B Mandal and G C Bhar
12. **Proc. National Conference on Sensor Technology-2002, Dehi, India**; Eds: A K Kapoor, J C Kapoor and D B Singh; Allied Publishers; p. 121-22

“Detection of solid explosives RDX and TNT by laser photo-acoustic techniques”
A K Chaudhury, *S Das*, G C Bhar and M S Rao

13. **Proc. National symposium on atomic, molecular structure, interactions and laser spectroscopy, BHU, Varanasi, India, Feb.22-24, 2002 p.16**
“Singly-resonant synchronously pumped optical parametric oscillator in the mid-infrared for spectroscopic application”
- *S Das*, P J Phillips and G C Bhar
14. **Proc. DAE-BRNS National Laser Symposium, LASTEC, Delhi, Dec. 13-15 (2000); p. 96**
“Ti:Sapphire Laser Pumped All Solid State mid-Infrared Laser Source”
- *S Das*, P J Phillips and G C Bhar
15. **Technical Digest CLEO 2000. May 7-12, 2007 ppr. CTuA27**
“Practical mid-infrared picosecond optical parametric oscillator for the 4-6 mm spectral range”
- P J Phillips, *S Das* and M Ebrahimzadeh
16. **Proc. International Conference on Fibre Optics and Photonics-Photonics’98, IIT Delhi, India Dec. 16-18 (1998) p. 841-844**
“Tunable mid-infrared source using KTA and its application”
- G C Bhar, U Chatterjee and *S Das*
17. **Proc. National Conference on Laser Application in Material Science and Industry, Kalpakkam, India Feb. 1997 p. 102-106**
“Characterisation of nonlinear crystals for development of tunable lasers”
- G C Bhar and *S Das*
18. **Proc. International Conference on Fibre Optics and Photonics-Photonics’96, IIT Madras, India Dec. 9-13 (1996) p. 1273-75**
“A Technique for detection of weak infrared radiation (10m m) with fast response at room temperature”
- G C Bhar and *S Das*
19. **Proc. National Laser Symposium, BARC, Mumbai, India Jan. 17-19 (1996) p. E4-E5**
“Efficient generation of mid-infrared radiation in mixed crystal”
- G C Bhar, *S Das* and U Nundy
20. **Proc. National Conference on Molecular Electronics and Chemical Computer Technology, NERIST, Itanagar, India Dec. 21 (1995)**
“Nonlinear optical technique for frequency conversion”
- *S Das* and G C Bhar
21. **Proc. International Conference on Emerging Opto-Electronic Technology, IISc. Bangalore, July 18-22 (1994) p. 33-37**
“Some aspects of optical second harmonic generation”
- G C Bhar, P K Datta and *S Das*

22. **Proc. International Workshop on Laser and Laser Application, Shanghai, China
Nov. 4-16 (1991)**
“Experimental nonlinear optical techniques for frequency multiplication”
- G C Bhar, *S Das* and P K Datta
23. **Proc. International Conference on Emerging Opto-Electronic Technology, IISc.
Bangalore, Dec. 16-20 (1991) p. 129-33**
“A Tunable UV-VIS-NIR laser”
- G C Bhar, *S Das* and P K Datta
24. **Proc. 2nd DST National Symposium on Lasers and Application, BHU, Varanasi,
Dec. 11-15 (1989) p. 226-227**
“A technique of infrared detection in nonlinear AgGaS₂”
- G C Bhar and *S Das*
25. **Proc. 1st DST National Symposium on Lasers and Application, IIT, Kanpur Dec.
2-5 (1987) p. 178-179**
“An efficient tunable laser for natural gas leak detection”
- G C Bhar and *S Das*