

CURRICULUM VITAE

Amiya K. Pani, Ph.D. (IIT K), FNASc, FASc
Visiting Professor
Department of Mathematics
BITS-Pilani, K K Birla Campus
Zuarinagar, Goa-403726 (India).
Email Address: amiyap@goa.bits-pilani.ac.in

1. General Details.

Date of Birth	: 3 rd June 1957	Place of Birth	: Ambabahali, (Orissa) India
Citizenship	: Indian	Marital Status	: Married with two children

2. Academic Qualifications.

Ph.D	Indian Institute of Technology, Kanpur	1986
M.Sc. (Mathematics)	Ravenshaw College Utkal University	1978
B.Sc. (Hons. in Mathematics)	Ravenshaw College Utkal University	1976

3. Field of Specialization.

Numerical Analysis, Partial Differential Equations and Industrial Mathematics.

To be more specific: Theory and Computation of Partial Integro-differential Equations, Flow through Porous Media particularly oil reservoir studies, Viscoelastic Fluid Flow Problems, Parabolic Free Boundary Problems, Variational Inequalities and Parabolic Control Problems.

4. Professional Experience.

Positions held.

Lecturer	Indian Institute of Technology Bombay	1986(December)-1989(May)
Assistant Professor	Indian Institute of Technology Bombay	1989(May)- 1994(July)
Associate Professor	Indian Institute of Technology Bombay	1994 (July)-1998 (Oct.)
Professor	Indian Institute of Technology Bombay	1998 (Oct.)- 2009 (August)
Professor (HAG)	Indian Institute of Technology Bombay	2009 (August)- 2022 (June)
Institute Chair Professor	Indian Institute of Technology Bombay	2011 (April) - 2014 (March)
Institute Chair Professor	Indian Institute of Technology Bombay	2014 (May) - 2017 (May) 2017 (May)-2020 (May)
Visiting Professor	BITS-Pilani, K K Birla Goa Campus,Goa	2022 (July)- Continuing

Visiting Positions. (Only Major Ones)

Visiting Research Fellow	CMA, Australian National University, Canberra	May'88-June'88
Visiting Research Fellow	CMA, Australian National University, Canberra	June'90-Dec'90
Visiting Research Fellow	Center for Mathematics and Its Applications, Australian National University,	June'92-July'92
Visiting Professor	Seoul National University, Seoul, South Korea.	Nov to Dec.'93
Visited	ICMS, Edinburgh Oxford Computing Lab University of Bath, University of Sussex Imperial College, London.	Nov.'95 Dec.'95
Visited	ICTP, Trieste (Italy).	7-27th Sept.'96
Visiting Professor	Federal University of Parana, Curitiba (Brazil).	Apr.- July'98
Visiting Associate Professor	Colorado School of Mines Golden (USA).	Aug.-Dec.'98.
Visiting Professor	Chiangmai University Chiangmai (Thailand)	May 13- May 20' 2000
Visiting Professor	Seoul National University, Seoul, South Korea.	20th May to 1st July'2000
Visiting Professor	Federal University of Parana, Curitiba (Brazil).	May- July'01
Visiting Professor	Colorado School of Mines Golden (USA).	June-July'02.
Visiting Professor	Isaac Newton Institute of Mathematical Sciences, Cambridge (UK)	May-June'03.
Visiting Professor	Humboldt University, Berlin	December'05.
Visiting Professor	Federal University of Parana, Curitiba (Brazil).	July-Aug.'06.
Visiting Professor	Humboldt University, Berlin	Nov.-Dec.'06 April-May'07.
Visiting Professor	Yonsei University, Seoul (Korea)	May-June'08.
Visiting Fellow	Oxford University, Oxford (UK)	August-Nov.'09.
Visiting Fellow	Oxford University, Oxford (UK)	May-July'10
Visiting Professor	UFPR, Curitiba (Brazil)	29th Nov-22nd Dec, 10
Visiting Professor	Chiangmai University (Thailand)	24th Dec, 10- 8th Jan., 11
Visiting Professor	UFPR, Curitiba (Brazil)	May- July,2011, Nov-Dec,2011
Visiting Professor	Chiangmai University (Thailand)	Dec, 2011- Jan., 2012.

Professional Services. Examined close to 30 theses or more from IITs, IISc, NITs, Universities, did refereeing job for many leading international journals, reviewed numerous projects for national as well as international funding agencies.

5. Recognition of Research Standing in the Profession.

(i) *Fellowships of Academies (Names, year).*

- Fellow of National Academy of Sciences (FNASc), Allahabad: 2002.
- Fellow of Indian Academy of Sciences (FASc), Bangalore : 2012.

(ii) *Research Based Awards.*

- **Professor S.C. Bhattacharya Award for Excellence in Pure Sciences-2016 from IIT Bombay.**
- **Felicited and awarded a trophy with a citation** by Honorable Rajnath Singh, Home Minister of Govt. of India for outstanding contributions in industrial and applied mathematics during the silver jubilee conference of the Indian Society for industrial and applied mathematics (ISIAM) held at Sharda University, Greater Noida, during 29-31 January, 2016, see for more details: http://www.math.iitb.ac.in/akp_award.pdf
- **Institute Chair Professor, IIT Bombay** for a period of three years during April 2011- March 2014, the second term during May 2014- May 2017, and the third term during May, 2017- May, 2020.
- **IRCC, IIT Bombay Best Research Paper Award** from IIT Bombay for the year 2010.
- **C. L. Chandana Award** for distinguished and outstanding contributions to Mathematics research and teaching in India (2002).
- Awarded **Best Young Mathematician** by the Indian Society of Industrial and Applied Mathematics for outstanding contributions in Numerical Analysis, Partial Differential Equations and Industrial Mathematics. (2000).
- **Nominated ICTP Senior Associate** of the Abdus Salam International Center for Theoretical Physics from January 2003 until 31st December 2008.

(iii) *Journal Editorships (Name, year).*

- International Journal of Numerical Analysis and Modeling (IJNAM): 2004- continuing.
- Field Institute Electronic Research Journal Math-in-Industry Case Studies (MICS). Continuing.
- Numerical Methods for PDEs: 2014- continuing.
- Computational Methods in Applied Mathematics (CMAM): 2016- continuing.
- Differential Equations and Dynamical Systems : An International Journal for Theory and Applications (DEDS): (2002-2017).
- J. Appl. Math. and Comp. (2004-07).
- *one of the Guest editors* of the Journal J. Analysis vol. 14 (2006) (with Kulkarni, Rekha P.; Kulkarni, S. H.; d'Almeida, Filomena D.).
- *One of the Guest Editors* of IJNAM-B Volume 3, Number 3 (2012) Special Issue on Mathematical Modelling and Application to Industrial Problems (with S. Panda and Neela Nataraj).
- *One of the Guest Editors* of the special issue on ‘Computational and Industrial Mathematics’ Edited by Jin Yun Yuan, Geovani Grapiglia, Cassio Oishi, Yunqing Huang, Yanren Hou, Amiya Pani Volume 387,15 December 2020 of the Journal ‘Applied Mathematics and Computation’.

(iv) *Other (specify).*

- **Member of the subcommittee** for the 2015 ICIAM (International Congress of Industrial and Applied Mathematicians) Maxwell Prize.
see, <http://www.iciam2015.cn/ICIAM%20Announces%202015%20ICIAM%20Prizes.html>
- **One of the Panel member** representing South Asia in the Round Table discussion on ‘Developing Mathematics in the Developing World’ held on 19th July, 2007 in the 6th International Congress on Industrial and Applied Mathematics (ICIAM 07) held in Zurich during July 16-20,07.
(see, https://www2.math.ethz.ch/iciam07/scientific_program/round_tables)
- **One hour invited talk** on *Particle Size Distribution in Emulsion Polymerizations : Some Computational Issues*, in the session on Applied Analysis and Industrial Mathematics in the *Third World Congress on Nonlinear Analysts 2000*, held in Univ. Catania (Italy), during 19-26th July’2000.

- **Plenary talk** on ‘*Discontinuous Galerkin Method: An old Wine in a New Bottle*’ in the international conference on Recent development in Applied and Computational Mathematics held in Chiangmai Univ. during January 4-7, 2011.
- **Plenary Talk** in the International Conference on ‘Computational Methods in Applied Mathematics (CMAM-5)’ held in Humboldt University, Berlin during July 30 - August 3, 2012.
- One hour Invited **Bama Charan Das Memorial talk** on ‘*Industrial Mathematics : Key to Key Technologies and its Impact on Research and Education in Mathematics*’ in the National Conference on ‘Recent Trends in Mathematics & Computing’ and 27th Annual Conference of Orissa Mathematical Society (March 11-12th ’2000), held in Utkal University, Bhubaneswar.
- **Key Note Address** on *Role of Mathematics in Engineering and Technology* in the 30th Orissa Mathematical Society and National Conference on Role of Mathematics in Engineering and Technology (Orissa) during 22nd to 23rd February’ 03.
- **Professor Rama Nath Mohanty Memorial Lecture** entitled ‘*Navier-Stokes Equations: A Million Dollar Open Problem*’ in the 30th Orissa Mathematical Society and National Conference on Role of Mathematics in Engineering and Technology (Orissa) during 22nd to 23rd February’ 03.
- **Professor Sankar Prasad Mishra Memorial Lecture** on ‘**How to Compute a Fair Price for an Option Derivative in Financial Market: A Case Study and Its Mathematical Implications**’ in the 31st OMS Conference held in the Institute of Physics, Bhubaneswar during 7th to 8th February’ 04.
- **Inaugurated the UGC sponsored Conference** on ‘Surprises in Mathematics and Their Applications’ held in Vivekanand College, Chembur during January 17, 2005 and September, 06.
- **B. C. Das Memorial Invited Talk** on ‘*Can Mathematicians help to extract more oil from the oil field*’ in OMS Conference held in Vyasaganagar College, Jajpur Road during January 26-29,07.
- **Inaugurated the workshop** and gave **14th Professor P.D. Sharma Memorial Lecture** entitled ‘*Navier-Stokes Equations: A Million Dollar Open Problem*’ in the workshop on Fluid Dynamics held in Jaipur University, Jaipur during August 07-08,2011.
- **45 minutes invited talk** on ‘*Semigroup theoretic approach to partial differential equations*’ in the Indian Science Congress held in Baroda (3-8 January’92).
- **One hour invited talk** on *Particle Size Distribution in Emulsion Polymerizations : Some Computational Issues*, in the session on Applied Analysis and Industrial Mathematics in the Third World Congress on Nonlinear Analysts 2000, held in Univ. Catania (Italy), during 19-26th July’2000.
- **Invited as a Resource person** in the International Workshop on ‘Analysis and Applications’, held during 15-17th May’2000 in the Department of Mathematics, Faculty of Sciences, Chiangmai University, Chiangmai (Thailand).
- **Invited as a Resource person** and gave 10 hour lectures on ‘*Scientific Computing*’ in the National Training Programme and Workshop on Industrial Mathematics at Kelaniya University, Colombo (Sri Lanka) during 26–30th December’01.
- **45 minutes invited talk** on ‘*Finite Element Analysis of PDEs: A Bird’s Eye View*’ in the Symposium on ‘*PDE, Scientific Computing and Applications*’ in the 75th Annual Conference of Indian Mathematical Society held in Kalasalingam University, Krishnankoil during ec. 27-30,2009.
- **Plenary Talk** in the International Conference on ‘Computational Methods in Applied Mathematics (CMAM-5)’ held in Humboldt University, Berlin during July 30 - August 3, 2012.
- **One of the Conveners** of *four workshops* for industry participants; *three Industry-IIT Meets*; *seven study group meetings on industrial problems* out of which three are in collaboration with Oxford Centre for Industrial and Applied Mathematics (OCIAM); *five study group meetings on industrial problems* under NPDE-TCA programme; *seven international workshops* (one in

University of Kelaniya, Sri Lanka in 2001, one in Chiangmai University, Chiangmai (Thailand), one with Brunel Univ. (UK), 4th with Humboldt University, Berlin (Germany) and recent one called Indo-German Advanced Workshop in IMA, Bhubaneswar during Feb 22-March 02, 2013). *three advanced level instructional schools* on modern PDEs, *four international conferences* in IITB and another *two international conferences* : one in MS University, Vadodara and other in IIT Kanpur, etc.

- One of the members of organising committees of several international conferences in India and abroad with more recent one is in UFPR, Curitiba(Brazil) during December 4-10,2010 and other in Chiangmai University, Chiangmai (Thailand) during January 06-07, 2011, and etc.

6. Administrative Responsibilities. (only major ones)

- Vice President of Indian SIAM starting from 2016.
- Member of Board of Governors (BOG) of IIT Bombay for a period of two years starting from January, 2016.
- Member of Board of Studies (BOS), Faculty of Mathematics and Computer Sciences, South Asian University (SAU) for period two years starting from January, 2016.
- Member of Board of Studies, Mathematics Department of IISER, Trivandrum for period 3 years starting from 2016.
- Member of IIT Bombay Senate Search Committee for a period of three year (January 2013- December, 2015).
- Member of IISER, Trivandrum Review Committee, 2015.
- Dean, Faculty of Mathematics and Computer Science, South Asian University, New Delhi from Jan-April 2014.
- Convenor of National Programme on Differential Equations: Theory, Computation and Applications (NPDE-TCA) for a period of five years starting from Feb, 2012 with a total cost of 4.5 crores. Under this program, every year three training programs (each of three weeks long), 6 advanced level programs (each of one week long), one modelling week and Study Group Meeting with Industry, visitors and internship programs are conducted. The NPDE-TCA is its fifth year now.
- Chairman, Joint Entrance Examination (JEE-2009).
- President of Faculty Forum (2004 May-August'09) and Vice-President of Faculty forum (2001-2004), IIT Bombay.
- Associate Chairman, IIT Campus School and Junior College (2004-2010).
- External Member chosen by the UGC for DSP-II for the Berhampur University and Jaipur University, Jaipur.
- Member of the selection committee of the Homi Bhaba Fellowships-2001.
- Member of the committee for Mathematical Sciences for Swarna Jayanti Award for the years 2014, 2015 and 2016.
- Member of the faculty selection committee of IITs, NITs, IIST, and many Universities etc.
- Reviewer of national (DST and other organisations) and international projects (Indo-French etc.), review of applications of professorships in Korean Institute of Science and Technology and Pohang Institute of Science and Technology, both in Korea, Petroleum Institute, Abu Dhabi (UAE) and review of faculty positions in IISc, IITs, IISERs, etc.
- Reviewer of many national and international journals.
- Convener of Institute Library Committee (2006-2008).

- Member of UGPC, B.Tech Review Committee, DPGC, Departmental Library Committee, Committee for Vision Report, Committee for Ph. D. programme, Committee for revised M.Sc. programme, Faculty Search Committee, DPC (Departmental Policy Committee), Seminar Committee. Member of Institute Library Committee, Member of UGPC etc.
- Convener of the Department Brochure Committee and Departmental Committee for Promotion of Research.
- External Examineer for Faculty of Science and Technology Programmes of the University of West Indies during 2013-2016.

7. Affiliation with Professional bodies.

Indian Society for Industrial and Applied Mathematics, India,
Orissa Mathematical Society, Bhubaneswar.

8. Organizing Conferences. (Few Selected ones)

Convener or Co-ordinator or Member of the Organizing Committee.

1. One of the organiser of Mini Conference on '*Free and Moving Boundary and Diffusion Problems*', held in CMA, ANU, (Canberra) June'90 (with R. S. Anderssen and Jim Hill).
2. One of the organiser of Mini-Conference on '*Inverse Problems in Partial Differential Equations*', held in CMA, ANU (Canberra) August, 1990 (with R. S. Anderssen).
3. One of thne Convener of Workshop on '*Industrial Mathematics*', held in MSU, Baroda (1993).
4. National Conference on '*Numerical and Qualitative Aspects of Differential Equations and Wavelet Analysis*', held in Utkal University, Bhubaneswar, (January 23-25' 98).
5. One of the Convener of International Conference on '*Nonlinear Systems : Modeling, Simulation and Applications*', to be held in NES College, Nanded during 26th December to 29th December'2000.
6. One of the Co-ordinators for the International Conference on '*Current Trends in Differential Equations and Dynamical Systems*' held in IIT Kanpur from 15th Dec. to 17th Dec.'2001.
7. Organised a special session on '*New Challenges in Mathematical Education*' in the International Conference on '*Nonlinear Systems: Modeling, Simulation and Applications*', held in NES Science College, Nanded during December 26-29, 2000.
8. Co-organiser of *two IIT-Industry Meets (with NRB (Nov. 20'99), Central Railway (Nov. 25'00)), three Study Group Meetings (One General (participants are from ABB, TRDDC, ADE, Crompton & Greaves Ltd.), BARC and ICICI Ltd.)*
9. One of Conveners of the **International Conference and Instructional Workshop** on '*Industrial Mathematics*' held in the Department of Mathematics, IITB from December 2-9'02 and **International Conference** on '*Recent Trends in Nonlinear Analysis*' during 11-13, December, 04 and **International Workshop (during Dec. 7-9,08) & International Conference** on *Recent Trends in Computational PDEs (ICCPDE-2008)* during Dec. 10-13,08.
10. One of the Director of **UNESCO sponsored Workshop** on '*Industrial Mathematics*' held in Department of Applied Mathematics, MS University, Baroda during 1st-7th Dec.'03.
11. One of the Co-ordinators of **European Union Funded WEBOPT Project sponsored Workshop** on '*Optimization and Risk Modeling*' and special seminar on '*Risk Modeling, Analysis and Management*' held in the Department of Mathematics, IIT Bombay, during 18-22 Dec.'03.
12. Co-ordinated **Indo-UK Study Group Meeting** on '*Industrial Problems*' during December 6-10, 2004 (with Mohan C. Joshi and John R. Ockendon(FRS, Oxford University (UK))). This is jointly organised by IMG and OCIAM under DST-Royal Society Science Network Programme.

13. One of the Co-ordinators of the **Instructional School** on *Computational PDE's* held in June, 2006 and one on *Modern PDEs* during May-June'07 at IIT Bombay and another **Instructional School and National Symposium on Hyperbolic PDEs** in IIT B during June 22-July 17, 2008.
14. One of the three Conveners of the 3rd **Indo-UK Study Group Meeting** on *Industrial Problems* jointly organised by IMG, IITB, MS University, Baroda and OCIAM (Oxford center for Industrial and Applied Mathematics), Oxford in MS university Baroda during March 20-24th., 2006 and One of the co-ordinators of 4th **Indo-UK Study Group Meetings** organised jointly by IMG (IITB), Department of Mathematics (IITR) and OCCAM (Oxford Univ, UK) during March 16-21,09.
15. One of the organiser of **Indo-German Workshop** on *Automatic Differentiation, Optimal Control and Adaptivity with Applications (ADOCOA-06)* held in IIT B during Nov. 11-17,06.
16. One of the Conveners of the **Brain Storming Sesion** on National Programme in '*Differential Equations: Theory, Computations and Applications*' held during October 18-19, 2006 at IIT Bombay.
17. Member of the organising committee of Thematic Year 2009-10 on PDE Models Arising in Multiscale Problems, Controls, Inverse Problems and Fluid Dynamics under IISc Math Initiatives.
18. Member of the organising committee of the Satellite Conference ICMPDE held in TIFR, CAM, Bangalore during Aug. 13-17,2010.
19. Member of the organising committee of the International Conference on Multiscale Analysis and Homogenization held in IISc, Bangalore during July 12-14, 2010.
20. Member of the Scientific Committee of the World Congress on Mathematics and Applications held in Federal University of Parana at Curitiba, Brazil during December 6-10, 2010.
21. Member of the Scientific Organising Committee of the International Conference on Recent Development on Applied and Computational Mathematics held in Chiang Mai University, Chiangmai, Thailand during January 4-6, 2011.
22. One of the Co-ordinators of the International Workshop on Advanced Computational PDEs held in BITS, Pilani, Goa Campus during February 7- March 5, 2011.
23. One of the Co-ordinators of the Modelling Week and Study Group Meeting on Industrial Problems held in IISc, Bangalore during March 7- March 26, 2011.
24. Member of the Scientific Organising Committee of the International Conference on Mathematical Modelling and Applications to Industrial Problems held in NIT Calicut during March 28-31, 2011.
25. Convenor of the proposed **National Programme** in *Differential Equations: Theory, Computations and Applications*.
26. One of the organisers of **Indo-European Workshop** on *Advances in Computational PDEs* held in BITS Goa during Feb 07-March 05, 2011.
27. One of the Conveners of **Indo-UK Symposium** on Recent Advances in Industrial and Applied Mathematics held in IITBombay during Nov. 5-6, 2011.
28. Organiser of DST Expert Committee Meeting on NPDE-TCA programme during April 14-15,2011.
29. One of the Conveners of the Workshop on Adaptive FEM held in IIST, Trivandrum during March 16-25, 2016.
30. The 54th Meeting of The PAC On Mathematical Sciences (Pac-Ms) On 22nd & 23rd November, 2012 at IIT Bombay (3 such including this were organised in IITB).
31. Coordinator and Speaker in the Workshop on Orthogonal Spline Collocation Methods for Partial Differential Equations at South Asian University, New Delhi, March 21-24, 2014.
32. Member of the Scientific Advisory Committee in the International conference on conference on 'Current Trends in PDEs: Theory and Computations' at the Faculty of Mathematics and Computer Science, South Asian University, New Delhi, December 28-30, 2015.

9. Invited Lectures in India/abroad. (only few)

I. Conferences (National), Workshops and Science Congress, few invited talks.

1. H^1 -Galerkin methods for a highly nonlinear Dirichlet problem using subspaces without boundary conditions, (30 minutes) in Varahmihir Memorial National Conference on 'Functional Analysis and its Applications', held in Vikram University, Ujjain (24-28, September'83).
2. 45 minutes invited talk on 'Semigroup theoretic approach to partial differential equations', in the Indian Science Congress held in Baroda (3-8 January'92).
3. *Industry and IIT Linkage: Mathematical Perspectives* -(1 hour) in the 4th Annual Conference of ISIAM, held in Jamia Milia, New Delhi (6-8th April'96).
4. 'Enhanced Oil Recovery in Reservoir Study: Some Computational Issues' (30 minutes) in the National Conference on Numerical Schemes and Qualitative Properties of Solutions of Differential Equations and Wavelet Analysis and the Silver Jubilee Conference of Orissa Mathematical Society (Jan. 23-25'98), held in Utkal University, Bhubaneswar.
5. 'Enhanced Oil Recovery in Reservoir Study: Some Computational Issues'- (one hour invited lecture) in the Workshop on the Partial differential Equations, held in the State University of Maringa, Brazil (June 4-5, 1998).
6. One hour invited Bama Charan Das Memorial talk on 'Industrial Mathematics : Key to Key Technologies and its Impact on Research and Education in Mathematics' (in the National Conference on 'Recent Trends in Mathematics & Computing' and 27th Annual Conference of Orissa Mathematical Society (March 11-12th '2000), held in Utkal University, Bhubaneswar.
7. Key Note Address on Role of Mathematics in Engineering and Technology in the 30th Orissa Mathematical Society and National Conference on Role of Mathematics in Engineering and Technology (Orissa) during 22nd to 23rd February'03.
8. Professor Rama Nath Mohanty Memorial Lecture entitled 'Navier-Stokes Equations: A Million Dollar Open Problem' in the 30th Orissa Mathematical Society and National Conference on Role of Mathematics in Engineering and Technology (Orissa) during 22nd to 23rd February' 03.
9. Resource Person fro the UNESCO Sponsored Workshop on Industrial Mathematics, department of Applied Mathematics, MS University, Baroda during 1-7, Dec.'03.
10. Professor Sankar Prasad Mishra Memorial Lecture on 'How to Compute a Fair Price for an Option derivative in Financial Market: A Case Study and Its Mathematical Implications' in the 31st OMS Conference held in the Institute of physics, Bhubaneswar during 7th to 8th February'04.
11. One hour talk on 'Industrial mathematics: Key to Key Technologies' in the UGC sponsored conferences on 'Surprises in mathematics and Their Applications' held in Vivekanand College, chembur during January 17, 2005.
12. One hour talk on 'Discontinuous Galerkin Methods for Elliptic PDE's' in the National Symposium on Scientific Computing with Application to partial Differential Equations during November 19-21, 2005.
13. One hour talk on Navier Stokes Equations: a Million Dollar Open Problem , and two hour talk on 'How to Compute a Fair Price in an American Option:A case Study in the National seminar on Partial Differential Equations and Scientific Computing' held in Veer Narmad South Gujarat University, Surat during January 23-25, 2006.
14. Invited talk entitled ' On Industrial Mathematics with a Case Study from Fincial Market' in LNMIT, Jaipur on 6th August, 2010.
15. A series of (18 hours) lectures on Fixed Point Methods and Applications to PDEs in the Department of Mathematics, Chiang Mai University, Chiangmai (Thailand) during Dec 26, 2010- January 3, 2011.

16. A series of two talks on Discontinuous Galerkin Methods in the International Workshop on Computational PDE held in Sultan Quaboos University, Muscat during January, 10-11, 2011.
17. Invited talk on ‘Can Mathematics help to extract more oil from the oil field ?’ in the UGC Sponsored National Workshop on Challenged before Applied Mathematicians: Fluid Dynamics and Optimization Techniques held in Rajstan University, Jaipur during March 11-13, 2011.
18. A series of lectures on Mathematical Foundation of Finite Element Methods in the International Workshop on Advanced Computational PDEs held in BITS, Pilani, Goa Campus during Feb 7- 13, 2011.
19. Colloquium talk entitled ‘On Industrial Mathematics with a Case Study from Finance’ held in IIST, Trivandrum on March 21, 2012.
20. Colloquium talk entitled ‘Scientific Computing: A New Way of Looking at Mathematics’ held in IISER, Trivandrum on March 22, 2012.
21. Two talks entitled ‘Optimal Control of Elliptic PDEs’ in the workshop on Variational Analysis and Optimization with Applications to PDEs during April 1-4, 2012 held in IIT Gandhinagar, Ahmedabad.
22. Invite talk entitled ‘On Industrial Mathematics with a Case Study from Finance’ held in the Department of Mathematics and Statistics (DOMAS) on 27th March, 2013.
23. Invited Speaker in the Symposium on Computational techniques and Mathematical Modeling at South Asian University, New Delhi, April 5-6, 2013.
24. A series of lectures in the Workshop on Orthogonal Spline Collocation Methods for Partial Differential Equations at South Asian University, New Delhi, March 21-24, 2014.
25. A series of lectures on The analysis of Finite Element Methods in the Pre-conference International Workshop held in Mandalay, Myanmar during November 5-6, 2014.
26. A series of talk on ”Consistency, Stability and Convergence: Three Pillars of Scientific Computing,” in the Advanced Workshop on Finite Difference Methods for Differential Equations during 13-17 March 2015., at South Asian University, New Delhi.
27. A series of talk on ”Numerical analysis of differential equations – finite difference methods ,” in the International Workshop held in Yangon in Myamar during Dec 2-3, 2015 at Yangon University of Education.
28. Invited talk on ”Navier-Stokes Equations: A Million Dollar Open Problem,” in the workshop entitled Mathematical Modeling and Computational Techniques (MMCT) in NIT Warangal, Warangal during December 7-11, 2015.
29. Invite talk on ”Scientific Computing: A New Way of Looking at Mathematics”, in the workshop entitled Mathematical Modeling and Computational Techniques (MMCT) in NIT Warangal, Warangal during December 7-11, 2015.
30. Invited talk on ”Navier-Stokes Equations: A Million Dollar Open Problem,” Punjab University, Chandigarh, 2015-12-6.
31. Invited talk on ”Scientific Computing: A New Way of Looking at Mathematics,” in one day Research Workshop called Cynosure on Dec. 7, 2015 at IIT Ropar, Ropar.

II. International Conferences and Mini-Conferences.

1. *A Galerkin method for the FitzHugh-Nagumo reaction diffusion system-* (30 minutes) in the International Conference on ‘Mathematical Model in Biological, Ecological and Environmental Systems’, held in IIT Kanpur (27-30th August’85).
2. *An H^1 -Galerkin method for quasilinear parabolic partial differential equations-* (30 minutes) in the International Conference on ‘Methods in Functional Analysis and Approximation Theory’, held in IIT Bombay (16-20th December’85).

3. *Method of time discretization for a nonlinear second order hyperbolic equation-* (30 minutes) in the International Conference on 'Nonlinear Analysis and Its Applications to Biomathematics', held in Andhra University, Vijaywada (24-28 August'87).
4. *A priori error estimates for finite element Galerkin approximations to a free boundary problem in polymer technology* -(30 minutes) in the Mini-Conference on 'Free and Moving and Diffusion Problems', held in the Center for Mathematical Analysis, ANU, Canberra (14-16th June'90).
5. *A finite element Galerkin method for parameters identification in parabolic problems*-(30 minutes) in the Mini-Conference on 'Inverse Problems in Partial Differential Equations', held in the Center for Mathematical Analysis, ANU, Canberra (23-25th August'90).
6. *A finite element method for parabolic free boundary problems*-(30 minutes) in the Mini-Conference on 'Approximate Methods for Boundary Value Problems', held in the Center for Mathematical Analysis, ANU, Canberra (12-14th December'90).
7. *On lumped mass finite element method with quadratures for integro-differential equations of parabolic type* -(30 minutes) in the International conference on 'Modern Analysis and Its Applications', held in IIT Delhi (11-14th December'92).
8. *Enhanced Oil Recovery in Reservoir Studies: Some Computational Issues* -(30 minutes) in the International conference on 'New Directions in Applied Mathematics', held in Hyderabad, (11-14th December'95). (with M. A. Mohamed Ali)
9. *An H^1 - mixed finite element Galerkin method for parabolic problems* -(30 minutes) in the International conference on 'Nonlinear Differential Equations and Applications', held in TIFR, Bangalore, (19-23rd August'96).
10. *An alternate mixed finite element method for parabolic partial differential equations-* in the Recent Advances in Numerical Simulations of PDEs held in ICTP, Trieste from September 19-27th.'96.
11. *'Some computational issues in Oil Reservoir Simulation'*- (45 minutes) in the International Conference on 'Functional Analysis with Applications', held in Aligarh Univ., Aligarh from Dec.16-19, 1996. (with M.A. Mohamed Ali).
12. *IIT-Industry Linkage : A Mathematical Perceptive* -(45 minutes) in the International Conference on 'Numerical and Stochastic Modeling', held in Utkal University at Bhubaneswar from January 5-7, 1997.
13. *An H^1 Galerkin Mixed method for Parabolic Equations* -(45 minutes) in the International Conference on 'Analysis and Applications', held in Chiangmai University (Thailand), during 18th-19th May'2000.
14. *An Alternate Mixed Finite Element Method for Evolution Equations*-(30 minutes) in the the International Conference on 'Applied Nonlinear Analysis 2000', held in Pukyong National University, Pusan (South Korea), during 15-16th June'2000.
15. *Oldroyd Model of Viscoelastic Fluids: Some Theoretical and Computational Issues*, (30 minutes) in the annual meeting of Korean Applied Mathematics Forum, held in Songee Mountain (June 26-28th'2000).
16. *Particle Size Distribution in Emulsion Polymerizations : Some Computational Issues*, (one hour) in the session on Applied Analysis and Industrial Mathematics in the Third World Congress on Nonlinear Analysts 2000, held in Univ. Catania (Italy), during 19-26th July'2000.
17. *Numerical Simulation of Particle Size Distribution in Emulsion Polymerization Process*, (one hour) in the International Conference on 'Nonlinear Systems : Modeling, Simulation and Applications ', held in NES College, Nanded during 26th Dec. to 29th Dec.'2000.
18. *Particle Size Distribution in Emulsion Polymerization—An Industrial Case Study and Its Impact in Mathematical Research*, in the International Conference on Industrial and Applied Mathematics in the Indian Subcontinent, held at Amritsar during 22nd to 25th January'2001.

19. *Oldroyd Model of Viscoelastic Fluids: Some Theoretical and Computational Issues*, (45 minutes) in the International Conference on ‘Current Trends in Differential Equations and Dynamical Systems’ held in IIT Kanpur from 15th Dec. to 17th Dec.’2001.
20. *Oldroyd Model of Viscoelastic Fluids: Some Theoretical and Computational Issues* in the French Indian Cyber-Workshop on Applied Mathematics between IISc and Toulouse University held in IISc Bangalore during 3rd to 6th February’03.
21. *Finite Element Galerkin Methods for the equations of Motions Arising in the Model of Viscoelastic fluids* in the eleventh conference on the Mathematics of Finite Element and Applications held at Brunel University during 21-24 June, 2003.
22. Plenary Talk on *Oldroyd model in Viscoelastic Fluid Flow Problems: Some Theoretical and Computational Issues* in the International Conference on Complex Systems, Control and Optimizations held in Northeastern University, Shenyang (China) during August 8-12, 2004.
23. Given 45 minutes invited talk entitled ‘*A New Mixed Finite Element Method for Evolution Equations: An Old Wine in a New Bottle*’ in the Indo-French Workshop on Partial Differential Equations and Applications during February 07-12, 2005 held in IISc Bangalore.
24. Given a talk on ‘Oldroyd Viscoelastic Model : Theoretical and Computational issues in the international Congress of Industrial and Applied Mathematics (ICIAM-2007), ETH Zurich, Switzerland July 16–20, 2007.
25. Invited talk on ‘Local Discontinuous Galerkin Method for Nonlinear Elliptic Problems’ in the 6th International Conference on Scientific Computing and Applications, held in Pusan National Univ., Busan, Korea during June 2-5,08.
26. Invited talk entitled ‘Oldroyd model: Theoretical and Computational Issues’ in the Satellite conference ICMPDE held in TIFR, Bangalore during Aug. 13-17, 2010.
27. Invited talk on ‘Some theoretical and Computational Issues in Oldroyd Model of Viscoelastic Fluids in the International Workshop on CFD and Computational Mathematics during September 10-11, 2010 held in Yonsei University, Seoul (S. Korea).
28. Invited talk entitled ‘On Industrial Mathematics with a Case Study from Option Derivatives in Finance in the International Congress in Mathematics and Applications held in UFPR, Curitiba (Brazil) during December 6-10, 2010.
29. Plenary talk entitled ‘Discontinuous Galerkin Method: An Old Wine in a New Bottle’ in the International Conference in Applied and Computational Mathematics held in Chiang Mai University, Chiangmai, Thailand during January 4-6, 2011.
30. Invited talk on Incompressible Miscible Displacement Problems in Oil Reservoir Studies: Some Theoretical and Computational Issues in the International Conference on Mathematical Modelling and Applications to Industrial Problems held in NIT Calicut during March 28-31, 2011.
31. Invited talk entitled ‘A posteriori estimates for multi-asset American options’ in the International Conference on International Conference on Mathematical Modeling in Industry (ICMMI) held in Univ. Sao Paulo, Brazil during November 30 to 2nd December, 2011.
32. Invited talk entitled ‘Discontinuous Galerkin Methods for Elliptic Problems : Old Wine in a New Bottle’ in the International Conference on Nonlinear Functional Analysis held in IMSc, Chennai during January 18-20, 2012.
33. Invited talk in the AMSS-PolyU Joint Research Institute Second Workshop on ‘Computational Mathematics’ held in the Hong Kong Polytechnic University, Hong Kong during May 25th-26th, 2012
34. Invited talk in the International Conference on ‘Applied Mathematics: Modeling, Analysis and Computation’ held in City University of Hong Kong, during 28 May - 1 June, 2012.
35. **Plenary Talk** in the International Conference on ‘Computational Methods in Applied Mathematics (CMAM-5)’ held in Humboldt University, Berlin during July 30 - August 3, 2012.

36. Invite talk entitled 'On an optimal control problem for the laser surface hardening of steel' in the 3rd International Conference on Numerical Analysis and Optimization (NAOIII) held in Sultan Qaboos University, Muscat (Oman) during January 5-7,2014.
37. **Plenary talk** on Scientific Computing: A New Way of Looking at Mathematics in the 7th International Conference on Science and Mathematics Education in Developing Countries held in Mandalay University, Mandalay, Myanmar during November 7-9, 2014
38. Invited talk on "Navier-Stokes Equations: A Million Dollar Open Problem," in the 8th International Conference on Science and Mathematics Education for Developing Countries Yangon University, Yangon, Myanmar during 4 – 6 December, 2015.
39. **Plenary talk** on "Through eyes of viscoelastic fluids: How can external stimulus influence research in theoretical and computational PDEs ?," in the International Conference on 'Current Trends in PDEs: Theory & Computations held in South Asian University, New Delhi during December 28-30, 2015.

10. Sponsored Research Projects.

1. A Research grant of US\$4,000 from the Third World Academy of Sciences (TWAS), ICTP (Trieste, Italy) for the Project on '*Numerical Methods for Strongly Damped Wave Equations*'.
2. Actively Involved in the Mission mode Project on '*Development of Tools for Analysis of Switchgear Mechanism*' under Technology Development Mission on Integrated Design and Competitive Manufacture (Rs. 153,35,00,000/-). (with Industry Partners :Crompton & Greaves Ltd and Larson & Toubro Ltd.).
3. Research grant of Rs.29,611,60/- from DST for the project entitled '*Doing Industrial Mathematics Via Genetic Algorithms (GAs), Differential Algebraic Equations (DAEs), Online Optimization, Computer Aided Geometric Design (CAGD) and Market Forecasting*', from DST 1998 (Co-Principal Investigator).
4. Research grant of Rs. 216,000,000/- (2.16 Crores) for the project entitled '*Physical and Numerical Models for Un-conventional Flood patterns*' from Institute of Reservoir Studies, Ahemdabad (ONGC).
5. Research Grant of Rs. 12,24,000/- for the DST-DAAD (PPP-05) project entitled '*Adaptive Mixed Finite Element Methods and Applications*' from DST-DAAD (PIs; Amiya Kumar Pani (India) and Professor Carsten Carstensen (Germany)).
6. Research Grant of Rs. 20,00,000/- from DST for the project '*The Oldroyd Model of Viscoelastic Fluids: Theoretical and Computational Studies*' (with Co-PI: Neela Nataraj)
7. Research Grant under Indo-Brazil (DST-CNPq) project 2009-2011 with PIs (Indian side) : A. K. Pani and Neela Nataraj and PI (Brazil side): Jin Yun Yuan, D. Pedro and H. Carlos.
8. Grant of Rs.4.5 crores for a National Programme in Differential Equations: Theory, Computation and Applications for a period of five years starting from 2012 (PI) with Neela Nataraj, S. Baskar and Sivaji Ganesh Sista.
9. Grant of Rs.1944600.00 for the DST project on 'Finite Element Methods For Parameter Identification Problems In Elliptic Partial Differential Equations for the period 2014-2017(Co-PI) with Neela Nataraj and M.T. Nair.

11. Contributions to Industrial Activity. As an active member in the Industrial Mathematics Group (IMG) at IIT Bombay, one of the objectives is to popularize Industrial Mathematics in our country. Presently, our main focus is

- on the numerical simulation of particle size distributions in emulsion polymerization process, crystal size distributions in industrial crystallization and financial derivatives (cf. M.Sc. Theses [11]-[14], B. Tech. Thesis [1]).

- to promote the industry-academic interaction through workshops(organised a quite a few for the industry), industry-IIT meets (organised a couple of meets), and study group meetings on industrial problems (the more recent ones are the Indo-UK Study Group Meeting organised jointly by IMG and OCIAM, Oxford in December'04 , March'05, March'06 and March'09, First KAUST Study Group in Mathematics for Industry 23rd – 26th January 2011, 5 study Group Meeting with Industry under NPDE-TCA programme).

12. Research Projects/Theses Supervised.

I. Doctoral Theses Guided.

1. T. Sengadir, Ph.D dissertation on '*Topological Transversality and Its Applications to Differential Equations*', (with Professor D.V.Pai) August'93.
2. L. Jones T. Doss, Ph.D dissertation on '*Finite Element Galerkin Methods for Parabolic Free Boundary Problems*', Sept.'94.
3. Rajen Kumar Sinha, Ph.D dissertation on '*Finite Element Methods for Time Dependent Parabolic Integro-Differential Equations with Non-smooth Data*', February'96.
4. M. A. Mohamed Ali, Ph.D. dissertation on '*Numerical Methods for Enhanced Oil Recovery in Reservoir Studies*', August '97.
5. Arul Veda Manickam, Ph.D. dissertation on '*Runge-Kutta Methods for Differential Algebraic Equations Resulting from the Spatial Discretization of Some Evolution Equations*', (with Professor Kannan M. Moudgalya), August' 98.
6. Pradeepa Nair, Ph. D. dissertation on '*Finite Element Approximations to Evolutionary Variational Inequalities*', submitted in June'02 (with Professor D. V. Pai).
7. Jyoti Agarwal, Ph.D. dissertation on '*Equivalent Dynamics and Efficient Integration Algorithms for a Class of Discontinuous Differential Algebraic Equations in Sliding Mode*', Chemical Engg. IIT Bombay, November'03 (jointly with Kannan Moudgalya).
8. P. Dhanumjaya, Ph. D. dissertation on '*Finite Element Galerkin Methods for Fisher- Kolmogorov Equations*' January'05.
9. Anil Kumar, Ph. D. dissertation on '*Optimal Control Problems Involving Parabolic Differential and Parabolic Integro-Differential Equations*' December'06. (jointly with Mohan K. Joshi).
10. Tirupathi Gudi, Ph. D. dissertation on '*Discontinuous Galerkin Methods for Non-linear Elliptic Problems*'.July,07 (jointly with Neela Nataraj).
11. Ajit Patel, Ph.D. Thesis on '*Mortar Finite Element Methods for Second Order Elliptic and Parabolic Problems* ', July 2008 (jointly with Neela Nataraj).
12. Sarvesh Kumar, Ph.D. dissertation on '*Finite Volume Element Methods for Incompressible Miscible Displacement Problems in Porous Media* ', July, 2008 (jointly with Neela Nataraj).
13. Debashish Pradhan, Ph.D. dissertation on '*Domain Decomposition Methods for Second Order Elliptic and Parabolic Problems*', September 2008 (jointly with Neela Nataraj).
14. Sangita Yadav, Ph.D. Thesis on '*Superconvergent Discontinuous Galerkin Methods for Elliptic and Parabolic Problems*', January,2011.
15. Deepjyoti Goswami, *Finite Element Galerkin Approximations to the Equations of Motion Arising in the Oldroyd Model*. Nov. 2011
16. Sajid Memon, Ph.D. thesis on: *Finite Element Methods for Pricing American Option* (with Sachin Patkar from EE). 2012.

17. Saumya Bajpai, Broad Areas of Research: *FEM for Equations of Motion for Kelvin-Voight Model* (with Neela Nataraj), February,2013 .
18. Asha Kisan Dond, *Adaptive FEMs for Second Order Linear and Nonlinear Elliptic Problems*, March, 2016 (with Neela Nataraj).
19. Sudeep Kundu, *Global Stabilization Problems for Benjamin-Bona-Mahony-Burgers' Type Equations and Their Finite Element Analysis*, Feb, 2018.
20. Rekha Khote, *A priori and A posteriori Error Analysis of Non-conforming Virtual Element Methods for Elliptic Problems*, August, 2022. (jointly with Carsten Carstensen from Humboldt University, Berlin).
21. Krishan Kumar, *Discontinuous Galerkin Method for Vlasov-Stokes and Vlasov-Navier Stokes Systems*, probable month of submission is December,2022. (jointly with Harsha Hutridurga).

M. Tech. Thesis Supervised.

1. Jitendra V. Kadam on '*Index Analysis and Adaptive Refinement in Multiscale Dynamic Optimization*', Department of Chemical Engineering, IIT Bombay (with Kannan M. Moudgalya, Thomas Binder & Wolfgang Marquardt (Process Technology RWTH, Aachen)), March'2000.
2. Prashant B. Vora on '*Control of Nonlinear Differential Algebraic Equation Systems*', Systems & Control Engineering, IIT Bombay (with Kannan M. Moudgalya), January'2001.
3. Shreyas S. Kirwai on *Mathematical Modelling of Hot Forging Die Wear*, IDP in Materials, Manufacturing and Modelling, (with Neela Nataraj), 2011.

13. List of Publications.

A. Proceedings Edited, Books etc.

1. *Free and Moving Boundary and Diffusion Problems*, CMA Proceedings Vol. 30, Australian National University, Canberra (1992) (with R.S. Anderssen and J.M. Hill).
2. *Inverse Problems in Partial Differential Equations*, CMA Proceedings Vol.31, Australian National University, Canberra 1992 (with R.S. Anderssen).
3. *Industrial Mathematics*, Proceedings of the International Conference on Industrial Mathematics, held at IIT Bombay during 7th-9th December'02, Narosa, New Delhi, 2006 (Mohan C. Joshi and Sanjeev Sabnis).
4. *One of the Guest editors* of the Journal J. Analysis vol. 14 (2006) (with Kulkarni, Rekha P.; Kulkarni, S. H.; d'Almeida, Filomena D.)
5. *One of the Guest Editors* of IJNAM-B Volume 3, Number 3 (2012) Special Issue on Mathematical Modelling and Application to Industrial Problems (with S. Panda and Neela Nataraj).

B. Published Papers in Journals.

1. C. Carstensen, R. Khot, A.K. Pani (2023), *Nonconforming virtual elements for the biharmonic equation with Morley degrees of freedom on polygonal meshes*, SIAM J. Numer. Anal. (Accepted). pp.1-25.
2. C. Carstensen, R. Khot, A.K. Pani (2023), *Supplementary Materials: Nonconforming virtual elements for the biharmonic equation with Morley degrees of freedom on polygonal meshes*, SIAM J. Numer. Anal. (Accepted). pp.1-21.
3. R. Jain, A. K. Pani and S. Yadav (2023), *HDG Method for Linear Parabolic Integro-Differential Equations*, Applied Mathematics and Computation (Accepted).

4. B.Bir, D.Goswami, A.K. Pani (2022), *Backward Euler method for the equations of motion arising in Oldroyd model of order one with nonsmooth initial data*, IMA Journal of Numerical Analysis, Vol. 42, Issue 4, pp. 3529-3570.
5. V.Anaya, D.Mora, A.K Pani, R.Ruiz-Baier (2021), *Numerical analysis of a new formulation for the Oseen equations in terms of vorticity and Bernoulli pressure*, Journal of Numerical Mathematics, vol. 30, no. 3, pp. 209-230.
6. C.Carstensen, R. Khot, A.K. Pani (2022), *A priori and a posteriori error analysis of the lowest-order NCVEM for second-order linear indefinite elliptic problems*, Numer.Math. 151, no. 3, pp.551-600.
7. N.Shravani, G Murali Mohan Reddy, A. K. Pani (2022), *Anisotropic a posteriori error analysis for the two-step backward differentiation formula for parabolic integro-differential equation*, J. Sci. Comput. 93 (2022), no. 1, Paper No. 26, 22 pp.
8. A.Kumar, A.K.Pani, M.C. Joshi (2022), *Approximate controllability of linear parabolic equation with memory*, Computers and Mathematics with Applications, vol. 128, no.15, pp.320-330.
9. Huangxin Chen, Amiya K. Pani and Weifeng Qiu (2022), *A mixed finite element scheme for biharmonic equation with variable coefficient and von Karman equations*, Commun. Comput. Phys. 31, no. 5, pp.1434-1466 .
10. R.Shokeen, A. Patel, and A.K. Pani (2022), *Primal hybrid method for quasi-linear parabolic problems*, J.Sc.Comput.93, no. 1, Paper No. 26, 22 pp.
11. C.Carstensen, N.Nataraj, A.K. Pani (2022), *Stability of mixed FEMs for non-selfadjoint indefinite second order linear elliptic PDEs* , Numer. Math.150, no. 4, 975-992 .
12. W Kang, BA Egbu, Y Yan, A K Pani (2021), *Galerkin finite element approximation of a stochastic semilinear fractional subdiffusion with fractionally integrated additive noise*, IMA J. Numer. Anal. Vol.42, no.3, pp. 2301-2335,
13. M. Khebchareon, A. K. Pany and Amiya K. Pani (2022), *An H^1 - Galerkin mixed finite element method for identification of time dependent parameters in parabolic problems*, Appl. Math. Comput. 424, Paper No. 127045, 14 pp.
14. B.Bir, D.Goswami, A.K.Pani (2022), *Finite Element Penalty Method for the Oldroyd Model of Order One with Non-smooth Initial Data*, Comput. Methods Appl. Math. 22, no. 2, 297–325.
15. P Danumjaya, Ambit Kumar Pany, Amiya K. Pani (2021) *Morley FEM for the fourth-order nonlinear reaction-diffusion problems*, Computers & Mathematics with Applications, 99, 229-245.
16. C Carstensen, S Gaddam, N Nataraj, A K Pani, D Shylaja (2021), *Morley Finite Element Method for the von Kármán Obstacle Problem*, ESAIM Mathematical Modelling and Numerical Analysis, 55(5), 1873-1894. arXiv preprint arXiv:2009.03205.
17. A.K. Pany, M.Khebchareon, A.K. Pani (2021), *Negative norm estimates and superconvergence results in Galerkin method for strongly nonlinear parabolic problems*, Computers & Mathematics with Applications, 99, 26-36.
18. Dohyun Kim, Amiya K.Pani and Eun-Jae Park (2021), *Morley finite element methods for the stationary quasi-geostrophic equation*, Comput. Methods Appl. Mech. Engrg.,375, <https://doi.org/10.1016/j.cma.2020.113639>.
19. S. Kundu and Amiya K. Pani (2020), *Global stabilization of two dimensional viscous Burgers' equation by nonlinear Neumann boundary feedback control and its finite element analysis*, J. Sci. Comput. 84 (2020), no. 3, Paper No. 45, 29 pp. 93D15 (65M12 65M15 65M60 93C20).
20. Yanyong Wang, Yuyuan Yan, Yubin Yan and Amiya K. Pani (2020), *Higher Order Time Stepping Methods for Subdiffusion Problems Based on Weighted and Shifted Grunwald–Letnikov Formulae with Nonsmooth Data* , J. Sci. Comp. 83, no. 3, Paper No. 40, 29 pp. 65M70 (35R11 35S10 65M12).

21. S. Karaa and Amiya K. Pani (2020), *Mixed FEM for Time-Fractional Diffusion Problems with Time-Dependent Coefficients*, J. Sci. Comp. 83, no. 3, Paper No. 51, 22 pp. 65M60 (35R11 35S16 65M12 65M15).
22. Amiya K. Pani, V. Thomee, and A.S. Vasudeva Murthy (2020), *A first order explicit-implicit splitting method for a convection diffusion problem*, Comput. Methods Appl. Math. 20 (4), 769-782.
23. P. Mishra, Kapil K. Sharma, Amiya K. Pani and Graeme Fairweather (2020), *High-order discrete-time orthogonal spline collocation methods for singularly perturbed 1D parabolic reaction-diffusion problems*, Numer. Meth. PDEs, 36 (3), 495-523. DOI: 10.1002/num.22438.
24. N. Sharma, M. Khebchareon and Amiya K. Pani (2020), *A priori error estimates of expanded mixed FEM for Kirchhoff type parabolic equation*, Numer. Algorithms, 83(1), 125-147. DOI: 10.1007/s11075-019-00673-2.
25. S. Kundu and Amiya K. Pani (2019), *Global Stabilization of BBM-Burgers' Type Equations by Nonlinear Boundary Feedback Control Laws: Theory and Finite Element Error Analysis*, J. Sci. Comp. 81 (2), 845-880.
26. S. Yadav and Amiya K. Pani (2019), *Superconvergent discontinuous Galerkin methods for nonlinear parabolic initial and boundary value problems*, Journal of Numerical Mathematics, 27 (3), 183-202. DOI: 10.1515/jnma-2018-0035.
27. S. Kundu and Amiya K. Pani (2019), *Stabilization of Kelvin-Voigt viscoelastic fluid flow model*, Appl. Anal. 98 (12), 2284-2307. <https://doi.org/10.1080/00036811.2018.1460810>.
28. P. Mishra, Kapil K. Sharma, Amiya K. Pani and Graeme Fairweather (2019), *Orthogonal spline collocation for singularly perturbed reaction diffusion problems in one dimension*, Int. J. Numer. Anal. Model. 16 (2019), 647-667.
29. N. Sharma, A.K. Pani and K.K. Sharma (2018), *Expanded Mixed FEM with Lowest Order RT Elements for Nonlinear and Nonlocal Parabolic Problems*, Adv. Comput. Math. 44, 1537-1571.
30. * C Carstensen, A.K Dond, N. Nataraj, Amiya K. Pani (2018) *Three first-order finite volume element methods for Stokes equations under minimal regularity assumptions*, SIAM J. Numer. Anal. 56, 2648-2671.
31. * S. Karaa, Amiya K. Pani (2018), *Error analysis of a FVEM for fractional order evolution equations with nonsmooth initial data*, ESAIM: Mathematical Modelling and Numerical Analysis 52 (2), 773-801.
32. S. Kundu, Amiya K. Pani, M. Khebchareon (2018), *Asymptotic Analysis and Optimal Error estimates for Benjamin-Bona-Mahony-Burgers Type Equations*, Numer. Meth. PDEs, 34 (3), 1053-1092.
33. S. Yadav and Amiya K. Pani (2018), *Superconvergence of a class of expanded discontinuous Galerkin methods for fully nonlinear elliptic problems in divergence form*, J. Comp. Appl. Math. 333, pp. 215-234.
34. S. Kundu, Amiya K. Pani (2018), *Finite element approximation to global stabilization of the Burgers' equation by Neumann boundary feedback control law*, Adv. Comput. Math. 44 (2), 541-570. DOI 10.1007/s10444-017-9553-9.
35. * S Bajpai, Amiya K. Pani (2017), *On a three level two-grid finite element method for the 2D-transient Navier-Stokes equations*, J. Numer. Math. 25 (4), 199-228. DOI 10.1515/jnma-2016-1055.
36. * S. Karaa, K. Mustapha, Amiya K. Pani (2018), *Optimal Error Analysis of a FEM for Fractional Diffusion Problems by Energy Arguments*, J. Sci. Comput. 74, pp.519-535. DOI 10.1007/s10915-017-0450-7.
37. N Ploymaklam, PM Kumbhar, Amiya K Pani (2017), *A priori Error Analysis of the local discontinuous Galerkin method for the Viscous Burgers-Poisson System*, Int. J. Numer. Anal. Model. 18, pp. 784-807.

38. S. Karaa and A.K. Pani (2017), *A posterior error estimates for mixed finite element Galerkin approximations to second order linear hyperbolic equations*, Int. J. Numer. Anal. Model. 18, pp. 571-590.
39. Ajit Patel, Sanjib K. Acharya, Amiya K. Pani (2017), *Stabilized Lagrange multiplier method for elliptic and parabolic interface problems*, Appl. Numer. Math. 120, pp. 287-304.
40. S. Kundu, S. Bajpai and Amiya K. Pani (2017), *Asymptotic Behavior and Finite Element Error Estimates of Kelvin-Voigt Viscoelastic Fluid Flow Model*, Numer. Algorithms, 75, pp. 619-653.
41. Asha K. Dond and Amiya K. Pani (2017), *A Priori and A Posteriori Estimates of Conforming and Mixed FEM for a Kirchhoff Equation of Elliptic Type*, Comput. Methods Appl. Math. 17, pp. 217-236.
42. * Asha K. Dond, N Nataraj and Amiya K. Pani (2016), *Convergence of an adaptive lowest-order Raviart–Thomas element method for general second-order linear elliptic problems*, IMA J. Numer. Anal. 37, pp. 832-860.
43. * S Karaa, K Mustapha, Amiya K. Pani (2017), *Finite volume element method for two dimensional fractional sub-diffusion problems*, IMA J. Numer. Anal. 37, pp.945-964.
44. Ambit K. Pany; S. K. Paikray; S. Padhy and Amiya K. Pani (2017) *Backward Euler Schemes for the Kelvin-Voigt viscoelastic fluid flow model*, Int. J. Numer. Anal. Model. 14, pp. 126–151.
45. S. Kundu, M. Khebchareon, Amiya K. Pani (2016), *On Kirchhoff’s Model of Parabolic Type*, Numer. Funct. Anal. Optimz. 37, pp. 719-752. Manuscript ID: 1176930 (LNFA-2015-0148.R2).
46. * C Carstensen, N Nataraj and Amiya K. Pani (2016), *Comparison results and unified analysis for first-order finite volume element methods for a Poisson model problem*, IMA J. Numer. Anal. 36, pp.1120-1142.
47. * C Carstensen, Asha K. Dond, N Nataraj and Amiya K. Pani (2016), *Error analysis of nonconforming and mixed FEMs for second-order linear non-selfadjoint and indefinite elliptic problems*, Numer. Math. 133, pp. 557-597 :DOI 10.1007/s00211-015-0755
48. Nisha Sharma, Morrakot Khebchareon, Kapil Sharma and Amiya K. Pani (2016), *Finite Element Galerkin Approximations to a Class of Nonlinear and Nonlocal Parabolic Problems*, Numer. Meth. PDEs. 32, pp.1232-1264.
49. * Ambit K. Pany; Saumya Bajpai; Amiya K. Pani (2016) *Optimal error estimates for semidiscrete Galerkin approximations to equations of motion described by Kelvin-Voigt viscoelastic fluid flow model*, J. Comput. Appl. Math. 302, pp. 234-257.
50. * M. Khebchareon, Amiya K. Pani and Graeme Fairweather (2016), *Convergence Analysis of Crank-Nicolson Orthogonal Spline Collocation Methods for Linear Parabolic Problems in two Space Variables*, IJNAM 13, pp.58-72.
51. S Karaa, S. Yadav and Amiya K. Pani (2015), *A priori hp-estimates for discontinuous Galerkin approximations to linear hyperbolic integro-differential equations*, Appl. Numer. Math. 96, pp.1-23.
52. * M. Khebchareon, A.K. Pani and Graeme Fairweather (2015), *Alternating direction implicit Galerkin methods for an evolution equation with a positive-type memory*, J. Sci. Comp. 65, pp.1166-1188.
53. S Karaa, Amiya K. Pani (2015), *A priori error estimates for finite volume element approximations to second order linear hyperbolic integro-differential equations*, arXiv preprint arXiv:1401.5139, IJNAM, 12, pp. 401-429.
54. S Karaa, Amiya K. Pani (2015), *Optimal error estimates of mixed FEMs for second order hyperbolic integro-differential equations with minimal smoothness on initial data*, arXiv preprint arXiv:1401.5134, J. Comput. Appl. Math. 275, pp. 113-134
55. Deepjyoti Goswami, A. K. Pani and Sangita Yadav (2014), *Optimal L2 estimates for semidiscrete Galerkin methods for parabolic integro-differential equations with nonsmooth data*, ANZIAM J. 55, pp. 245-266. .

56. S. Bajpai, N. Nataraj and A. K. Pani (2014), *On a two-grid finite element scheme for the equations of motion arising in the Kelvin-Voigt model*, Adv. Comp. Math. 40, pp.1043-1071.
57. Amiya K. Pani, Ambit K.Pany, P. Damazio and J. Y. Yuan (2014), *A modified nonlinear spectral Galerkin method for the equations of motion arising in the Kelvin-Voigt fluids*, Appl. Anal. 93, pp.1587-1610.
58. * Deepjyoti Goswami, Amiya K. Pani and Sangita Yadav (2013), *Optimal error estimates of two mixed finite element methods for parabolic integro-differential equations with nonsmooth initial data*, J.Sci. Comp.,56, pp.131-164.
59. * S. Yadav, Amiya K.Pani and E.J.Park (2013),*Superconvergent discontinuous Galerkin methods for nonlinear elliptic equations*, Math. Comp., 82, pp. pp.1297-1335.
60. S. Bajpai, N. Nataraj and A. K. Pani (2013), *On fully discrete finite element schemes for equations of motion of Kelvin-Voigt fluids*, Intl.J. Numer. Anal. Modelling, 10, pp.481-507
61. Sangita Yadav, Amiya K. Pani and Neela Nataraj (2013), *Superconvergent Discontinuous Galerkin Methods for Linear Non-selfadjoint and Indefinite Elliptic Problems*, Journal of Scientific Computing, 54, pp.45-76.
62. S. Bajpai, N. Nataraj, A. K. Pani, P. Damazio and J. Y. Yuan (2013), *Semidiscrete Galerkin method for equations of motion arising in Kelvin-Voigt model of viscoelastic fluid flow*, Numer. Meth. PDE., 29, pp. 857-883.
63. * Sajid Memon, Neela Nataraj and Amiya K. Pani (2012), *An A posteriori Error Analysis of a Mixed Finite Element Galerkin Approximation to Second Order Linear Parabolic Problems* SIAM J. Numer. Anal., 50, pp. 1367-1393.
64. P. Danumjaya and A.K. Pani (2012), *Mixed finite element methods for a fourth order reaction diffusion equation*, Numer Meth PDE.,28, pp. 1227-1251.
65. Deepjyoti Goswami and A.K.Pani (2011), *An Alternate Approach to Optimal L^2 -error analysis of semidiscrete Galerkin methods for linear parabolic problems with nonsmooth initial data*,Numer. Funct. Anal. Optimz., 32, pp. 946-982.
66. D. Pradhan,S. Baskar, Neela Nataraj and A.K. Pani (2011), *A Robin-type Non-Overlapping Domain Decomposition Procedure for Second Order Elliptic Problems*, Adv. Comput. Math. 34, pp. 339-368.
67. * Deepjyoti Goswami and A. K. Pani (2011), *A priori error estimates for semidiscrete finite element approximations to equations of motion arising in Oldroyd fluids of order one*, International J. Numer. Anal and Modelling (IJNAM), 8, pp.324-352.
68. * A.K. Pani and Sangita Yadav (2011), *An hp-local discontinuous Galerkin method for parabolic integro-differential equations*, J. Sci. Comp. 46, pp.71-99.
69. *A. K. Pani, G. Fairweather and R.I. Fernandes (2010), *ADI Orthogonal Spline Collocation Methods for Parabolic Integro-Differential Equations*, IMA J Numer Anal. 30, pp. 248-276.
70. Nupur Gupta, Neela Nataraj and A.K. Pani (2010), *On the optimal control problem of laser surface hardening*, Internl. J. Numer Anal. Model, 7, pp. 667-680.
71. Sarvesh Kumar,Neela Nataraj and A. K. Pani (2009), *Discontinuous Galerkin finite volume methods for second order linear elliptic problems*, Numer. Meth. PDEs.25, pp.1402-1424.
72. * T. Gudi, Neela Nataraj and A. K. Pani (2009), *On L^2 -Error Estimate for Non-Symmetric Interior Penalty Galerkin Approximation to Linear Elliptic Problems with Nonhomogeneous Dirichlet Data*, J. Comput. Appl. Math.228,pp.30-40.
73. * T. Gudi, Neela Nataraj and A. K. Pani (2008), *A mixed discontinuous Galerkin method for the biharmonic equation*, J. Scientific Computing. 37,pp.139-161.
74. A.K. Patel, A.K. Pani and Neela Nataraj (2008) *A mortar element method for parabolic problems*, Numer. Meth. PDEs.24,pp.1460-1484.

75. * T. Gudi, Neela Nataraj and A. K. Pani (2008), *hp-discontinuous Galerkin methods for strongly nonlinear elliptic boundary value problems*, Numer. Math.109, pp.233-268.
76. * A. K. Pani, Graeme Fairweather and Ryan Fernandes (2008), *Alternate Direction Implicit Orthogonal Spline Collocation Methods for an Evolution Equation with a positive type memory term*, SIAM J. Numer. Anal.46, pp. 344-364.
77. D. Pradhan, A.K. Pani and Neela Nataraj (2008), *An explicit/implicit Galerkin domain decomposition procedure for parabolic integro-differential equations*,J Appl. Math. Comp.28, pp. 295-311.
78. * T. Gudi, Neela Natraj and A. K. Pani (2008), *An hp-local discontinuous Galerkin method for some quasi-linear elliptic boundary value problems of non-monotone type* , Math. Comp. 77, pp. 731-756.
79. Sarvesh Kumar, Neela Natraj and A. K. Pani (2008), *Finite volume element method for second order hyperbolic equations*, Intl.J . Numer. Anal and Modeling:5 , pp. 132-151.
80. Pritam Mantri, Neela Natraj and A.K. Pani (2008), *A quolocation method for Burgers' equation*, J. Comp. Math. Appl. 213, pp. 1-13.
81. * Anil Kumar, M. C. Joshi and A. K. Pani (2007), *On Approximation Theorems for Controllability of Non-linear Parabolic Problems*, IMA J. Math. Control Info.24, pp.115-136.
82. * T. Gudi and A. K. Pani (2007), *Discontinuos Galerkin Methods for Quasilinear Elliptic Problems on Nonmonotone Type*, SIAM J. Numer Anal. 45, pp. 163-192.
83. * J. Agarwal. Kannan Moudgalya and A. K. Pani (2006), *Sliding Motion of Discontinuous Dynamical Systems Described by Semi-Implicit Index One Differential Algebraic Equations*, 61 , pp. 4722-4731, Chemical Engineering Science.
84. * A. K. Pani, Jin Yun Yuan and Pedro D. Damazio (2006), *Linearized Backward Euler Method for the Equations of Motion Arising on the Oldroyd Model*, SIAM J. Numer. Anal. 44, pp. 804-825 .
85. P. Dhanumjaya and A. K. Pani (2006), *Numerical methods for the extended Fisher-Kolmogorov Equation*, International J. Numer. Anal. and Modeling, 6, pp. 186-210.
86. S. Nigam, Kannan M. Moudgalya and A. K. Pani (2006), *Equivalent dynamic solution of an industrial HDPE slurry reactor*, Comp. Aided Chem. Engg. 20, pp. 285-290. ESCAPE-16/PSE-2006, Gramisch-Partenkirchen, pp. 9-13.
87. * A. K. Pani and Jin Yun Yuan (2005), *Semidiscrete finite element Galerkin approximation to the equations of motion arising in the Oldroyd model*, IMA J. Numer. Anal. 25, pp. 750-782.
88. Pradeepa Nair and A. K. Pani (2005), *Finite Element Approximation to a Class of Viscoelastic Problems with Short Memory under Conditions of Friction*, Dynamics of Continuous, Discrete and Impulsive Systems, Ser. B: Appl. & Algorithm, 12, pp. 360-380.
89. * L Jones Doss and A. K. Pani (2005), *A quolocation method for unidimensional single phase Stefan problem*, IMA J. Numer. Anal. 25, pp. 139-159.
90. P. Dhanumjaya and A. K. Pani (2005), *Orthogonal cubic spline collocation method for the extended Fisher-Kolmogorov equation*, Journal of Computational and Applied Mathematics , 174, pp. 101-117.
91. A. K. Pani and Sang K. Chung (2004), *A second order splitting lumped mass finite element method for the Rosenau equation*, Differential Equations and Dynamical Systems, 12 (2004), pp. 331-351.
92. * Jyoti Agarwal, Kannan M. Moudgalya and A. K. Pani (2004), *Sliding motion and stability of a class of discontinuous dynamical systems*, Nonlinear Dynamics, 37, pp. 151-168.
93. S. Arul Veda Manickam, Kannan M. Moudgalya and A. K. Pani (2004), *Higher order fully discrete scheme combined with H^1 -Galerkin mixed finite element method for semilinear reaction-diffusion equations*, J. Applied Mathematics and Computing, 15, pp. 1-28.
94. Rajen K. Sinha, Ajay K. Otta and A. K. Pani (2004), *An H^1 -Galerkin mixed method for second order hyperbolic equations*, International J. Numer. Anal and Modeling, 1, pp. 111-130.

95. Rajen K. Sinha, A. K. Pani and Sang K. Chung (2003), *The effect of spatial quadrature on the semidiscrete finite element Galerkin method for a strongly damped wave equation*, Number Funct. Anal and Optimiz. 24, no. 3-4, pp. 311-325.
96. Pradeepa Nair and A. K. Pani (2003), *Finite element methods for parabolic variational inequalities with a Volterra term*, Numer Funct. anal & Optimize. 24, pp. 107-127.
97. * A. K. Pani and Graeme Fairweather (2002), *An H^1 -Galerkin mixed finite element method for an evolution equation with a positive type memory term*, SIAM J. Numer. Anal. 40, pp. 1475-1490.
98. * A. K. Pani and Gareme Fairweather (2002), *H^1 -Galerkin mixed finite element methods for parabolic integro-differential equations*, IMA J. Numer. Anal. 22, pp. 231-252.
99. * A. K. Pani and Sang K. Chung (2001), *Numerical methods for the Rosenau equation*, Applicable Analysis, 77, pp. 351-369.
100. * Rajen K. Sinha and A. K. Pani (2001), *Finite element approximation with quadrature to a time dependent parabolic integro-differential equations with non smooth initial data*, J. Integral Equations and Appl.13, pp. 35-72.
101. A. K. Pani and Jin Yun Yuan (2001), *Mixed finite element method for the strongly damped wave equation*, Numer. Meth. PDE, 17, pp.105-119.
102. * Rajen K. Sinha and A. K. Pani (2000), *Error estimates for semidiscrete Galerkin method for time dependent parabolic integro-differential equations with non smooth data*, CALCOLO: A Quarterly on Numerical Analysis and Theory of Computation, Springer Verlag Publ., 37, pp. 181-205.
103. * A. K. Pani (1999), *A qualocation method for parabolic partial differential equations*, IMA J. Numer. Anal. 19, pp. 473-495.
104. * Rajen K. Sinha and A. K. Pani (1998), *The effect of spatial quadrature on finite element Galerkin approximation to a hyperbolic integro-differential equations*, Numer. Funct. Anal. & Optimiz. , 19, pp. 1129-1153.
105. Arul Veda Manickam, Sang K. Chung and A. K. Pani (1998), *A second order splitting combined with cubic spline orthogonal collocation method for the Rosenau equation*, Numer. Meth. PDE. 14, pp. 695-716.
106. * Rajen K. Sinha and A. K. Pani (1998), *On the backward Euler method for time dependent parabolic integro-differential equations with non smooth initial data*, J. Integral Equations and Appl. 10, pp. 219-249.
107. * Rajen K. Sinha and A. K. Pani (1998), *Quadrature based finite element approximation to time dependent parabolic equations with non smooth initial data*, CALCOLO: A Quarterly on Numerical Analysis and Theory of Computation, 35, pp. 225-248, Springer Verlag Publ.
108. M. A. Mohammed Ali and A. K. Pani (1998), *An H^1 -Galerkin mixed finite element method combined with the modified method of characteristics for incompressible miscible displacement problems in porous media*, Differential Equations and Dynamical Systems 6, pp. 77-85.
109. * A. K. Pani (1998), *An H^1 -Galerkin mixed finite element method for parabolic partial differential equations*, SIAM J. Numer. Anal. 35, pp. 712-727.
110. Arul Veda Manickam, Kannan . Moudgalya and A. K. Pani (1998), *A second order splitting combined with cubic spline orthogonal collocation method for the Kuramoto- Sivashinsky equation*, Computers & Mathematics with Applications, 35, pp. 5-25.
111. * A. K. Pani, T Sengadir and D. V. Pai (1997), *A Leray Schauder type theorem and its applications to neutral functional differential equations*, Nonlinear Analysis TMA, 28, pp. 701-720.
112. Jones T. Doss, S. Padhy and A. K. Pani (1997), *A priori L^2 -error estimates for a Stefan-type problem in one space dimension*, Numer. Meth. PDEs., 13, pp. 393-416.

113. S. K. Chung, M. G. Park and A. K. Pani (1997), *Convergence of finite difference method for the generalized solutions of Sobolev equations*, J. Korean Math. Soc., 34, pp. 515-532.
114. * Haritha Saranga and A. K. Pani (1997), *Finite element Galerkin method for the 'good' Boussinesq equation*, Nonlinear Analysis: TMA, 29, pp. 937-956.
115. T. Sengadir and A. K. Pani (1996), *Weak solutions of integro-differential and functional differential equations*, Differential Equations and Dynamical Systems 4, 411-422.
116. * A.K. Pani and Todd E. Peterson (1996), *Finite element methods with numerical quadrature for parabolic integro-differential equations*, SIAM J. Numer. Anal., 33, pp. 1084-1105.
117. Rajen K. Sinha and A. K. Pani (1996), *Negative norm estimates and super convergence results for parabolic integro-differential equations*, J. Integral Equations and Appl., 8, pp. 65-98.
118. S. K. Chung and A. K. Pani (1995), *On the convergence of finite difference schemes for generalized solutions of Sobolev equations*, J. Korean Math. Soc., 32, pp. 815-834.
119. L Jones T. Doss and A. K. Pani (1995), *On super convergence results and negative norm estimates for a unidimensional single phase Stefan problem*, Numer. Functional Anal. & Opt., 16, pp. 153-175.
120. T. Sengadir and A. K. Pani (1994), *Topological Transversality: applications to second order integro-differential and functional differential equations*, Bull. Austral. Maths. Soc. 49, 251-264.
121. A. K. Pani (1993), *A finite element method for a diffusion problem with constrained energy and non-linear boundary conditions*, J. Austral. Math. Soc. Ser B, 35, pp. 87-102.
122. * A. K. Pani, V. Thomee and L. B. Wahlbin (1992), *Numerical methods for hyperbolic and parabolic integro-differential equations*, J. Integral Equations & Applications, 4, pp. 533-584.
123. A. K. Pani and P. C. Das (1991), *A finite element method for a single-phase semilinear Stefan problem in one space dimension*, Numer. Funct. Anal. & Optimiz., 12 (1991), pp. 153-171.
124. * A. K. Pani and P. C. Das (1991), *A priori error estimates for a single-phase quasilinear Stefan problem in one space dimension*, IMA J. Numer. Anal., 11, pp. 377-392.
125. * A. K. Pani and P. C. Das (1991), *A finite element Galerkin method for a unidimensional single-phase nonlinear Stefan problem with Dirichlet boundary conditions* IMA J. Numer. Anal., 11, pp. 99-113.
126. D. Bhaguna, V. Raghavendra and A. K. Pani (1990), *Rothe's method to semilinear hyperbolic integro-differential equations*, J. Appl. Math. & Stoch. Anal., 3, pp. 245-252.
127. * A. K. Pani and P. C. Das (1989), *A priori error estimates in H^1 and H^2 -norms for Galerkin approximations to a single phase nonlinear Stefan problem in one space dimension*, IMA J. Numer. Anal., 9, pp. 213-229.
128. A. K. Pani and P. C. Das (1987), *An H^1 -Galerkin method for a Stefan problem with a quasilinear parabolic equation in non-divergence form*, Internatl. J. Math. & Math. Sci., 10, pp. 35-360.

C. Research articles (not abstracts) published in refereed conference proceedings.

1. Lok Pati Tripathi, Amiya K Pani, Graeme Fairweather (2018), *A Qualocation Method for Parabolic Partial Integro-Differential Equations in One Space Variable*, In: Dick J., Kuo F., Woźniakowski H. (eds); Contemporary Computational Mathematics-A Celebration of the 80th Birthday of Ian Sloan, Pages 1147-1174, Springer, Cham.
2. Sarvesh Kumar, Neela Nataraj and A. K. Pani (2007), *Finite volume element method for the incompressible miscible displacement problems in porous media*, PAMM. Proc. Appl. Math.Mech.7, pp. 2020015-2020016.
3. L. Jones Doss and A. K. Pani (2006), *Semidiscrete qualocation method for the Stefan problem*, Industrial Mathematics, Eds. Mohan C. Joshi, Amiya K. Pani and Sanjeev V. Sabnis, Narosa Publ. House, New Delhi, pp.105-120.

4. P. Dhanumjaya and A. K. Pani (2005), *Finite element method for the extended Fisher-Kolmogorov (EFK) equation*, Differential Equations and Dynamical Systems, Ed. D. Bhaguna, Narosa Publ. House, New Delhi.
5. J. Agarwal, Kannan M. Moudgalya and A. K. Pani (2005) *A nonlinear gas-liquid systems in the sliding motion*, Differential Equations and Dynamical Systems, Ed. D. Bhaguna, Narosa Publ. House, New Delhi.
6. Jyoti Agarwal, Kannan M. Moudgalya and A. K. Pani (2003), *Sliding motion of discontinuous dynamical systems described by differential algebraic equations*, Proceedings of the 2002 American Control Conference, Omni Press, pp. 795-800.
7. Pradeepa Nair and A. K. Pani (2003), *Semi-discrete finite element method for a class of visco-elastic problems with long memory under condition of friction*, Proceeding of Hyp2002: Ninth International Conference on Hyperbolic Problems: Theory, Numerics and Applications, Springer Verlag, pp. 745-754.
8. Prashant Vora, Kannan M. Moudgalya and A. K. Pani (2002), *Control of higher index DAE system through a linear control law*, Proceedings of the 2002 American Control Conference, Anchorage, Alaska, Omni Press, pp. 465-470.
9. Joyti Agarwal, Kannan M. Moudgalya and A. K. Pani (2002), *An efficient integration algorithm for a class of discontinuous dynamical systems in sliding motion*, Proceedings of the 2002 American Control Conference, Anchorage, Alaska, Omni Press, pp. 689-703.
10. Pradeepa Nair and A. K. Pani (2002), *Finite element approximation to an evolutionary variational inequality with a Volterra term*, Proceeding of the First International Conference on Industrial Mathematics in the Indian Sub-Continent, (Eds. A.H. Siddiqi and M. Kočvara), Kluwer Academic Press, London, pp. 317-338.
11. Rajen K. Sinha and A. K. Pani (1998), *A qualocation method for hyperbolic integro-differential equations*, in the Proceedings of 4th SIAM International Conference on Mathematical and Numerical Aspects of Wave Propagation (June 1-5, 1998- Colorado School of Mines, Colorado), Ed. J. A. De Santo, SIAM Publication, Philadelphia, pp. 723-726.
12. A. K. Pani (1998). *An H^1 -Galerkin mixed finite element method for the second order wave equations*, in the Proceedings of 4th SIAM International Conference on Mathematical and Numerical Aspects of Wave Propagation (June 1-5, 1998- Colorado School of Mines, Colorado), Ed. J. A. De Santo, SIAM Publication, Philadelphia, pp. 648-651.
13. L. Jones T. Doss and A. K. Pani (1997), *A qualocation method for a second order semilinear two-point boundary value problem*, Functional Analysis With Current Applications in Science, Technology and Industry, (Eds. M. Brokate and A. H. Siddiqi), Pitman Research Notes in Mathematics, pp. 128-144.
14. M. A. Mohammed Ali and A. K. Pani (1997), *Mixed Finite Element Methods for Compressible Miscible Displacement Problems in Reservoir Studies*, Functional Analysis With Current Applications in Science, Technology and Industry, (Eds. M. Brokate and A. H. Siddiqi), Pitman Research Notes in Mathematics, pp. 332-352.
15. A. K. Pani and R. S. Anderssen (1992), *Finite element methods for identification of parameters in parabolic problems*, CMA Proceedings of Mini-Conference on 'Inverse Problems in Partial Differential Equations', Australian National University, Canberra (August 23-25, 1990). A. K. Pani and R. S. Anderssen (eds.), CMA Proceedings, 31, pp. 208-221.
16. A. K. Pani and R. S. Anderssen (1992), *A priori error estimates for finite element Galerkin approximations to a free boundary problem in polymer technology*, CMA Proceedings of Mini-Conference on 'Free and Moving Boundary and Diffusion Problems', Australian National University, Canberra (June 14-16, 1990), R. S. Anderssen, J.M. Hill and A. K. Pani (eds.), CMA Proceedings, 30, pp. 142-153.
17. A. K. Pani (1990), *A finite element approximation to a unidimensional nonlinear ablation problem*, Proceeding of 6th International Conference on 'Numerical Methods in Thermal Problems', Swansea 1989, R. W. Lewis (ed.), Peneridge Press, pp. 101-107.

18. A. K. Pani and P. C. Das (1990), *Finite element approximation to a single phase quasilinear Stefan problem*, Proceedings of International Colloquium on ‘Free Boundary Problems : Theory and Applications’. Isree/Bavaria (West Germany) 1987, K.H. Hoffman and J. Sprekels (eds.), Pitman Research Notes in Mathematics Vol. 186, Longman Scientific & Technical Publ., pp. 582-588.
19. P. K. Mishra and A. K. Pani (1986), *A method of interpolation of scattered data to a regular grid*, Proceedings of National Space Science Symposium, Guwahati University (Feb. 19-22).
20. P. C. Das and A. K. Pani (1986), *An H^1 -Galerkin method for quasilinear parabolic differential equations*, Proceedings of International Conference on ‘Methods of Functional Analysis in Approximation Theory’, IIT, Bombay 1985. C.A. Micchelli, D.V. Pai and B.V. Limaye (eds.) International Series of Numerical Mathematics 76, Birkhäuser Verlag Publ., 356-370.
21. A. K. Pani and P. C. Das (1985), *C^0 -interior-penalty Galerkin method for slightly compressible miscible displacement in porous media*, Proceedings of International Conference on Nonlinear Mechanics, Sanghai (China), Chein Wei Zang (ed.), Science Press, Sanghai, 1186-1191.

D. Other Publications/ reports.

(i) *Submitted Manuscripts*

1. S. Karaa, and Amiya K. Pani (2016), *Error analysis of a finite volume element method for fractional order evolution equations with nonsmooth initial data*, (Revised Version Submitted)
2. S. Kundu and Amiya K. Pani (2016), *Stabilization of Kelvin-Voigt viscoelastic Fluid Flow model*, arXiv preprint arXiv: 1606.03653. (Revised Version submitted)
3. Anil Kumar, Amiya K. Pani and Mohan C. Joshi (2016), *Approximate Controllability of a Class of Partial Integro-Differential Equations of Parabolic Type*, arXiv preprint arXiv:1606.03673.

14. Summary of Scientific Contributions. The main scientific contributions include:

- *a complete solution to the 14th open problem* cited in the Proceedings of the Workshop on ‘Free Boundary Problems’, held in Freie University, Berlin (1977, Vol.I, page 185) which is related to optimal error estimates of the finite element approximation to a single phase nonlinear Stefan problem in one space dimension, (cf. [94]–[95], [97]–[98],[89], [93] in the list of published papers).
- *the reduction of the storage requirement for the fully discrete schemes for the Partial Integro-Differential Equations without losing accuracy* ([92] in the list of published papers). It has been acknowledged by researchers that this is a rather powerful scheme in that it incorporates sparse quadrature rules to achieve substantial reduction in memory storage ¹.

¹Extract from page 402 of : Applications and numerical analysis of partial differential.... - Shaw and Whiteman (1997):Comput. Methods Appl. Mech. Engg., 150:397—409, 1997.”,

.....For space time problems this can result in algebraic problems of much larger dimensions than strictly necessary. To begin to address this vacuum of analysis, [—] proposed and analyzed a fully discrete scheme for H which was subsequently implemented in the viscoelasticity context in [—]. After this work was completed the authors of [—] discovered the newly published work in [92—Pani et. al. 1992]. *This is a rather powerful scheme in that it incorporates the sparse quadrature of [—]. Another advantage of this scheme over that in [—] is that if A is time independent the matrix requiring inversion at each time level is also time independent.*

Extract from page 321 of the paper: S. Shaw, M. K. Warby and J. R. Whiteman, ‘Discrete schemes for treating hereditary problems of viscoelasticity and applications’, J. Comp. Appl. Math. 74 (1996), pp.313–320.

The work in [27—their Research Report] was originally intended to fill a perceived gap in the literature for problems of this type, but shortly after it was completed, a paper (of which we are unaware) by Pani et al. [79,J. Integral Equations and Appl. 1992] appeared in print that had already addressed this issue.

- *the effect of numerical quadratures on finite element methods for parabolic integro-differential equations with non-smooth initial data* (cf. [86] in the list of published papers). As has been pointed by one of the referees ², this represents an advancement in the basic theory of finite element methods for parabolic integro-differential equations.
- *a complete solution to an open problem on L^2 error estimate for Galerkin approximation to parabolic integro-differential equation with non-smooth initial data* cited in the book ‘Finite Element Methods for Integro-Differential Equations’, (page 106) written by C. Chen and T. Shih, see [70], [72] in the list of published papers. (pl. refer to the abstract of [70]).
- *an introduction of a new mixed finite element method called H^1 -Galerkin mixed method* with analysis, which does not use LBB (Ladyzhenskaya, Babuska and Brezzi) condition, see [67]–[68],[79]–[80],[54]–[55] and [51] in the list of published papers. It is expected that this new method will be a viable alternative to the classical mixed method,(refer to citations of [79] as 154 and [68] as 104 (extracted from Google Scholars)).
- *a generalization of qualocation method which was initially developed for the integral equations as well as for two point boundary value problems to partial differential equations* (cf. [73], [59] and [50] in the list of published papers).This constitutes a major result as it opens up to include a class of second order time dependent partial differential equations.
- *proposing a new approach to derive a continuous system of differential algebraic equations (DAE) of index one, that is, dynamically equivalent to a sliding motion of discontinuous index one DAEs* (see, [62] [53] and [56] in the list of published papers and [3], [5]–[6] and [9] in the list of published proceeding papers). This procedure is demonstrated with practical examples from soft-drink manufacturing process and industrial HDPE slurry reactor systems. The proposed method is several order of magnitude more efficient than the procedure that works with discontinuous system of DAEs.
- *new regularity results for equations of motion arising in the Oldroyd model of visco-elastic fluid flow problems. An introduction of a new Stokes-Volterra projection helps to derive optimal error estimates for finite element Galerkin approximations under realistically assumed conditions on the data* (see, [57], [54] and [37] in the list of published papers). As has been mentioned by a reviewer of MATHSciNet on [57], it should constitute an excellent reference for researchers interested in this subject.
- *analysis and numerical simulation of discontinuous Galerkin (DG) methods for quasilinear and strongly nonlinear elliptic problems* (see, [52], [48], [45], [42]–[43] in the list of published papers).A part from existence of a unique solution to the discrete problems, discussion of hp error analysis constitutes a significant advancement of the DG methods. Moreover, the scope of super-convergence results for a class of DG methods which include HDG method and primarily for linear self-adjoint elliptic PDEs has been extended to nonlinear elliptic problems and a new post processing of solution has been developed,see, [29], [31], [3].
- *Derivation with analysis of a new alternate implicit direction (ADI) methods*, which otherwise quite difficult to apply the standard ADI methods to such problems combined with orthogonal spline collocation method for evolution Equations with positive type memory term, see, [46], [39] and also [22].
- *deriving new regularity results for the Kelvin-Voigt visco-elastic model*, which are valid uniformly in time as $t \mapsto \infty$ and uniformly on Voigt regularization parameter κ as $\kappa \mapsto 0$. Based on a newly developed Stokes-Sobolev projection, optimal finite element error estimates are established, which preserve the decay property and are valid for κ as κ tends to zero, see [32], [30], [26],[19], [14] and [5].

For general problems, their scheme is more powerful than ours (assuming u is smooth enough in time) in that a certain sparse quadrature rule is employed for the history term. This greatly alleviates the problems of calculation time and solution history storage generated by history integrals.....Another advantage of their scheme over the one above is that they do not treat the history term in implicit way.

²An extract from the referee’s report : *The reference [86] represents an advancement in the basic theory of finite element methods for parabolic integro-differential equations.*

This confirms theoretically the extensive numerical experiments conducted by various researchers that the decay rate of the Kelvin-Voigt model is slower than the decay rate of the Navier-Stokes system when the forcing function is zero.

- *On establishing optimal priori error estimates* for both finite element as well as finite volume element methods with right kind of regularity results using energy arguments for linear fractional sub-diffusion problems with both smooth and non-smooth initial data, see [6],[13] in the published papers. The energy type argument has limited use in this class of problems due to presence of fractional derivative in time and it is expected that our analysis will unify the results, available for Heat equations using energy arguments.
- *On obtaining both a priori and a posteriori estimates* for nonconforming and mixed FEMs for non-smooth solutions of second order linear non-selfadjoint and indefinite elliptic problems. Specially for L^2 estimate for the displacement, a novel way of using the equivalence of mixed FEM and nonconforming method helps to achieve the required result, see [17], [12],[16].

Our contributions to the finite element analysis of the partial integro-differential equations have been acknowledged in the preface (iv) of the book entitled ‘Finite Element Methods for Integro-differential Equations’, by C. Chen and T. Shih³

A part from two papers [92]and [86] of Professor Pani cited in the book by C.Chen and T.Shih, the article [52] in the list of published papers is now cited in Text in Applied Mathematics Vol. 15 (The Mathematical Theory of Finite Element Methods) by S. C. Brenner and L. R. Scott published by Springer Verlag.

15. References.

- | | |
|--|---|
| <p>1. Professor Vidar Thomee
Department of Mathematics
Chalmers University of Technology
S-412 96 Goteborg, Sweden
Email: thomee@chalmers.se</p> | <p>2. Professor Graeme Fairweather
Mathematical Reviews
American Mathematical Society
416 Fourth Street, Ann Arbor
MI 48103, U.S.A.
Email:gxf@ams.org</p> |
| <p>3. Professor Carsten Carstensen
Department of Mathematics
Institute for Mathematics
Humboldt University, Berlin
Unter den Linden 6
D-10099 Berlin, Germany.
Email: cc@math.hu-berlin.de</p> | <p>4. Dr. Robert Scott Anderssen
CSIRO
GPO Box 664, Canberra
ACT 2601, Australia
Email: bob.anderssen@csiro.au</p> |
| <p>5. Professor Mohan C. Joshi
Department of Mathematics
IIT Gandhinagar
Ahmedabad
Gujarat-382424
Email: mcj@iitgn.ac.in</p> | <p>6. Professor Olivier Pironneau
UPMC Univ Paris 06, UMR 7598
Laboratoire Jacques-Louis Lions (LJLL)
Boite courrier 187, 75252
Paris Cedex 05. France
Email: olivier.pironneau@upmc.fr</p> |

³The extract from the preface reads as:

In recent decades, many researchers such as V. Thomeé, I. H. Sloan, L. B. Wahlbin, G. Fairweather,, A. K. Pani,....., etc. have done valuable work in application of finite element methods to integro-differential equations and have attained remarkable achievements.