Chapter 7

SCHOOL & CENTRES

Aryabhatta Centre for Nanoscience and Technology
School of Engineering and Technology

Aryabhatta Centre for Nanoscience &Technology (**ACNN**) under School of Engineering and Technology of Aryabhatta Knowledge University, Patna, is an Interdisciplinary super specialized, experimental new science of frontier areas of subject of 21st century. This ACNN is first cutting edge Research Centre of university of Bihar which was initiated by Department of Education, Govt. of Bihar. All together about 22 high-end research instruments such as Atomic force microscope, Scanning Tunneling Microscope, Mulfiferroic system, Vibrating sample Magnetometer etc. have been procured. M.Tech and Ph.D. programmes in Nanoscience & Technology are successfully running since year 2013. The aura of promise of Nanoscience and Technology influenced our Honourable Chief Minister Sri Nitish Kumar Ji and Founder Vice chancellor, Prof. S.N.Guha and he readily agreed to support the establishment of Nanoscience and Nanotechnology Centre at Aryabhatta Knowledge University. At present Different affairs of Establishment, Administration and other academic, research & Devlopement programmes are in progress under the leadership of Dr. Rakesh Kumar Singh, Head (Professor incharge-Establishment, Academic and Administration). Faculty members of this research center have published papers in peer reviewed/ Impact factor/ Indexed Journals and actively involved to create a conducive atmosphere of Scientific Research/ related activities in a state Bihar and outside too. The Structural, Optical, Magnetic, Optical and Electrical Nanomaterials characterization laboratory well equipped with Wi-Fi. Thrust areas of research of ACNN are Food nanomaterials, Ferroelectric materials, Ayurvedic bhasama and nanomedicine, Magnetic nanomaterials, Ceramics, metal nanoparticles and Nano-biotechnology, Nanosilica from Rice husk(Agriculture waste) etc.

Thrust areas of innovation of ACNN are Teaching through low cost/No cost experiment, Science & Technology popularization to ignite the potential of youth and Inspire for sustained growth of society. Hon'ble Vice Chancellor, Pro Vice Chancellor and Registrar and all staff member of this university have been very supportive in establishment and functioning of the Aryabhatta Center for nanoscience and nanotechnology, Aryabhatta Knowledge University.

7.1. M. Tech Project (2016-2018 session): On Going

M. Tech (Session 2016-18) Research Project details with name of the supervisors are following. Among 9 M. Tech scholar, 6 scholar are working under the supervision of Dr. Rakesh Kr Singh, Asst. Prof and Head and 3 scholar are working under Dr. A.K.Jha, Asst. Prof. These are the 3rd Batch of M.Tech of Nanoscience center, AKU.

Sl. No.	Name	Registration No.	Faculty	Category	Supervisor Name
1.	Sonu kumar	16601601001	M.Tech.	SC	Dr. Anal Kant Jha
2.	Abhishek Ranjan	16601601002	M.Tech.	SC	Dr. Rakesh Kr Singh
3.	Atul Jyoti	16601601003	M.Tech.	OBC	Dr. Rakesh Kr Singh
4.	Shashi Bhusan	16601601004	M.Tech.	Gen	Dr. Anal Kant Jha
5.	Shubhra	16601601005	M.Tech.	OBC	Dr. Rakesh Kr Singh
6.	Nishant Kumar	16601601006	M.Tech.	EBC	Dr. Rakesh Kr Singh
7.	Ambedkar Kr. Verma	16601601007	M.Tech.	EBC	Dr. Anal Kant Jha
8	Amit Kumar	16601601008	M.Tech.	OBC	Dr. Rakesh Kr Singh
9.	Sampurnanand	16601601009	M.Tech.	OBC	Dr. Rakesh Kr Singh

7.1.1. 2nd Batch of Ph .D Students (Session 2016-2018) and their supervisor name detail

Sl. No.	Name	Registration No.	Faculty	Category	Supervisor
1.	Naveen Kumar	16602601001	Ph.D.	SC	Dr. Anal Kant Jha
2.	Archana Kumari	16602601002	Ph.D.	Gen	Dr. Rakesh Kr Singh
3.	Vijay Kumar	16602601003	Ph.D.	OBC	Dr. Anal Kant Jha
4.	Sweta Sinha	16602601004	Ph.D.	Gen	Dr. Rakesh Kr Singh

7.1.2. M. Tech Research Project (2015-2017 session): Submitted

The title of M. Tech thesis and name of supervisor for 2015 batch have been approved by Board of studies of the nanoscience center and academic council of this university, as mentioned below. All the students have completed their research project and submitted project thesis on 7th October 2017. 3 scholar submitted their thesis under Dr. Rakesh Kr Singh, Asst. Prof cum Head, While 1 scholar submitted their thesis under Dr. Anal Kant Jha.

Sl. No.	Name	Faculty	Guide/ Supervisor	Research Topic
1.	Akanksha Kumari	M.Tech.	Dr. Rakesh kr. Singh	Synthesis and characterization of Nano silica from Rice husk.
2	Kumar Shivam	M.Tech.	Dr. Rakesh Kr. Singh	Preparation of Nickel and Cobalt Ferrite Nanoparticle at different annealing temperature and Evaluation of their Structural, Electrical and Magnetic properties.
3.	Neelam Prabha	M.Tech.	Dr. Rakesh Kr. Singh	Synthesis of some Rare earth substituted ferrite Nano materials and investigation of their Electrical and Magnetic properties.
4	Utpal Singh	M.Tech.	Dr. Anal Kant Jha	A study of silver Nano particles added PVDF-ZnO nanocomposites

7.1.3. Ph. D thesis Submitted/awarded(First batch of ACNN, AKU)

I. The first Ph. D thesis of this Nanoscience center, AKU was submitted by Sri Sanjay Kumar of Year 2013 session under the supervision of Dr. Rakesh Kr Singh, Asst. Prof cum Head, Nanoscience center , AKU on the topic" Synthesis Characterization and Applications of some Ayurvedic bhasma as Nanomedicine" on 1st September 2017.

II. While another pre-Ph.D thesis submission presentation was completed on 31st October 2017, of Mr. Abhay Kumar Aman of year 2013 session under supervision of Dr. Rakesh Kr Singh, Asst. Prof cum Head, Nanoscience center, AKU on the topic " Synthesis, Characterization of nanosize food materials and its applications".

Total no. of Ph.D scholar registered in first batch-2013 session was 6 in which 2 scholar-Mr.Sanjay Kumar and Abhay Kr Aman was working, under the supervision of Dr. Rakesh Kr Singh and completed their Ph.D thesis submission presentation. Ms. Priti Kumar under Dr. K.Prasad is working for thesis while Ms. Niraj Kumari under the supervision of Dr. Anal Kant Jha and Dr. K. Prasad(Co-Guide), Ms. Babita Jha &Ms. Mugdha Rao are working for their thesis under the supervision of Dr. Anal Kant Jha.

7.2 Doctoral Research (Ph.D) of 2013 session and 2015 session

The Board of Studies of Center for Nanoscience and Nanotechnology and academic council of AKU has approved the title of Ph.D thesis with supervisor. Thesis and the name of Supervisors of the following students are following.

S. No.	Name	Faculty	Guide/ Supervisor	Research Topic (Proposed)
1.	Harendra Kr. Satyapal	Ph.D.	Dr. Rakesh Kr. Singh	Preparation of Some hexaferrite nanomaterials, investigation of their Mechanical, Electrical and Magnetic properties and evaluation of their possible applications.
2	Abhay Kr Amam	Ph.D	Dr. Rakesh Kr Singh	Synthesis, Characterization of nanosize food materials and its applications"
3	Sanjay Kumar	Ph.D	Dr. Rakesh Kr Singh	Synthesis, Characterization and applications of Some Ayurvedic Bhasmas as Nanomedicine.
4	Priti Kumar	Ph.D	Dr. K Prasad	Metal and Oxide Nanoparticles: Their Anti-Microbial Activity and Cytotoxicity Assay
5	Niraj Kumar	Ph.D	Dr. K Prasad and Dr. A K Jha	Biosynthesis of few metal nanomaterials using medicinal plants for Biomedical applications.
6	Mugdha Rao	Ph.D	Dr. A K Jha	Nanomaterials Synthesis and Characterizations from Kitchen Waste and Their Biological Applications
7	Sabiha Zamini	Ph.D	Dr. Anal Kant Jha	Biosynthesis of metal Nanomaterial using some common Pteridophyts
8	Babita Jha	Ph.D	Dr. Anal Kant Jha	Green Synthesis of Gold and Platinum Nanoparticles Using Medicinal Plants for Biomedical Applications
9.	Sweta Sinha	Ph.D	Dr. Rakesh Kr Singh	Study of Physical properties of Calcium based Ayurvedic Bhasma as nanomaterials by Employing modern scientific tools and application
10	Archana	Ph.D	Dr. Rakesh Kr Singh	Effect of Superfine grinding on the Physico-chemical and Morphological Studies of some food materials at nanosize and their application
11	Vijay Kumar	Ph.D	Dr. Anal Kant Jha	Synthesis of $Ba(Zr_{0.2}\ Ti_{0.8})O_3$ and $(Ba_{0.7}Ca_{0.3})TiO_3$ using Different soft chemicals.
12	Naveen Kumar	Ph.D	Dr. Anal Kant Jha	Synthesis and characterization of Nanomaterials using some commonly expired medicines.

7.3 Enrolment of Students

7.3.1. M. Tech (2017-2019)

Sl.	Student Name
1	Zeeshan Hashmi
2	Anurag Kumar ---------- GEN
3	Rakesh Ranjan ----------EBC
4	Ayush Kumar ---------- GEN
5	Shivam Kumar ----------EBC
6	Farhan Ahmad Khan ----------GEN
7	Ashutosh Kumar ----------EBC
8	Raj Aryan ----------EBC
9	Abhishek Kumar ----------GEN
10	Archana Kumari ---------- -BC
11	Monalisa ---------- --BC

7.3.2. Ph. D (2017-2019)

Sl.	Student Name
1	Bibhuti Bikramaditya ----------GEN
2	Basant Kumar Singh ---------- BC
3	Md. Kamar Tanbir ----------
4.	Dr. Prabhat Kr Dwedi ---------- GEN

7.4 Award of Degree

M. Tech Nanoscience and nanotechnology scholar of session 2013-15 awarded Degree in 2016

First batch of M. Tech Scholar, ACNN, AKU awarded degree in convocation and they are: Md. Kamar Tanvir, Harsh Ranjan, Saurbh Sharma, Naveen Kumar, Uttam Kr Mahto and Nitendra Kumar

7.5 Achievements of the Centre at National/International Level

National links / collaborations for promoting teaching and research

- Nanotechnology Application Centre, University of Allahabad, Allahabad
- Department of Physics, Indian Institute of Technology, Kanpur.
- School of Materials Science & Technology, IIT, BHU, Varanasi.
- Department of Nanoscience & Physics, Indian Institute of Technology, Patna.
- Magnetic Measurement Laboratory, National Physical Laboratory, New Delhi
- Central Glass & Ceramic Research Institute, Kolkata
- University Department of Physics, T.M. Bhagalpur University, Bhagalpur
- Dept. of Physics & ferroelectric Material research center, A N College Patna
- P.G. Department of Physics, Patna University, Patna
- Mahavir Research Institute cum Cancer center, Patna

7.6 Basic and advanced facilities available in the Centre

Following are the infrastructure available/facilities created at ACNN to undertake researches in Nano Science & Technology at the moment:

- Smart Classroom
- Library (Number of Reference Books: 136)
- Soft-Chemical Laboratory (Materials synthesis)
- Bio-Chemical Laboratory (Materials synthesis)
- Computational Nanotechnology Laboratory
- Printing and Xerox facility (Coloured and B/W)
- Internet facility
- Multimedia projector
- Clean and fully air conditioned workspace
- Structural Characterization Laboratory
- Nano Characterization Laboratories (Electrical, Optical, Thermal, *etc.*)
- Safe drinking water facility (RO system)
- Faculty Chambers
- Office and Store rooms
- Appraisal area
- Fire safety arrangement
- Stand-by power supply

7.7 Research facilities available at the centre

Facilities developed for carrying out Academic and R & D works at the Centre:

Infrastructure facilities

- Air-conditioned working laboratory (Soft Chemical, Bio-Chemical and Computational Nanotechnology) space and furniture
- Water & electricity

- Standby power supply (two 20 kVA UPS and ten small (2 kVA and 500 VA) ones)
- Computational and Printing (B/W and Colour) facilities
- Telecommunication & Internet facility
- Xerox machine (B/W and Colour)
- Multimedia and Overhead projector
- Library facility
- Smart classroom
- Academic Laboratory
- LPG connection in laboratories
- Safe drinking water facility (RO system)
- Appraisal area
- Administrative / Secretarial support
- Fire-fighting arrangements

7.8 Curricular and Extracurricular Activities.

Dr. R.J.Choudhary, Sientist of UGC-DAE- CSR delivered a lecture on 19th May 2017, at ACNN, AKU. Prof. S.M.Karim, Hon'ble Pro-Vice Chancellor Felicitated to Dr. Choudhary. Dr. Rakesh Kr Singh, Head of the center, given detail introduction and conducted this event as a coordinator.

National Science Day-2017 Celebrated at ACNN
(Thankful to Dr. C V Raman for their contributions in Science)

Freshers day for 2017 session of M.Tech and Ph.D scholar was held on 22nd Aug.17. Hon'ble Pro Vice Chancellor, Prof. S.M.Karim, Prof. Ajay Pratap Registrar, Dr. Kumar Anjana Dy. Registrar, Er. Rajeev Ranjan, COE and Dr. Rakesh Kumar Singh, Head of the Center, Dr. Anal kant Jha, Asst. Prof. address the new batch of scholar. Mr. Bibhuti Bikramaditya, Ph.D scholar is from Industry and spoke different possible research in the area of Nanoelectronics.

Ph.D scholar of nanoscience with faculty member, Dr. Rakesh Kr Singh, visited with DST, Govt. of Bihar and interacted with Science & Technology officials and given their research presentations.

Ph.D students of nanoscience center with teachers day-2017 Changed photo of 2017.

Young India- A Resurgent Nation: from Sankalp to Sidhi- Address by Hon'ble Narendra Modi, PM, India- M.Tech and Ph.D students participated with enthusiasm.

Dr. Kumar Anjana, Dy. Registrar, AKU and Dr. Rakesh Kr Singh, Head of the Nanoscience, AKU were programme coordinator.

***Essay contest on Public Participation in Promoting Integrity and Eradicating Corruption*".**

Participants with Hon'ble Vice Chancellor, AKU, and head and faculty member, ACNN.

Essey contest on Public Participation in Promoting Integrity and Eradicating Corruption" Was held on 26th October 2016 at Aryabhatta center for nanoscience and nanotechnology of Aryabhatta Knowledge University, Patna. Ph. D and M.Tech students of nanoscience center, Ph.D education scholar, AKU participated and presented variours issues related to public participation and eradicating corruption. Dr.S.P.Singh, the then Vice Chancellor, AKU inaugurated the events and address the participants. This programme essay on "Public Participation in Promoting Integrity and Eradicating Corruption".is being organized by AKU, central vigilance commission Delhi and S.B.I main branch Patna. According to CVC, 31st Oct-5th Nov. 2016 is declared as observing vigilance awareness week and its focal theme is- "Public Participation in Promoting Integrity and Eradicating Corruption". The CVC has advised to organized this activities in academic institutions with a view to create awareness on ill-effects of corruptions in the society. The programme coordinator Dr. Rakesh Kumar Singh, Asst. Prof. cum Establishment officer of Aryabhatta center for nanoscience and nanotechnology spoken on the theme of this events. Dr. Anal Kant Jha, Asst. Prof, was one of the jury member. Dr. K.Prasad, Prof. & Head given final concluding remark.

Winner of the Essay contest with CVC chairman and Registrar at S.B.I main branch

Prof. (Dr.) Ajay Pratap, Registrar, AKU, Coordinator of the essay contest Dr. Rakesh Kumar Singh, Asst. Prof. Cum Establishment officer, Aryabhatta center for nanoscience, AKU, Winner of the Essay contest, Ms. Babita Jha, Abhay Kumar, Ms. Mugdha Rao, Ms. Sapna Suman, Mr. Sushil Kr Singh, Mr. Utapal Singh (Ph.D scholars, Nanoscience center

& Dept. of Education, AKU, M.Tech Scholar), felicitated at S.B.I, head center, Patna by Chairman central vigilance Commission Delhi.

Prof. K.L.Chopra, Ex- Director, IIT Kharagpur Visit to Nanoscience Center, AKU

Prof. K.L Chopra, Former director, IIT Kharagpur and president society for scientific Values, Delhi Visited Nanoscience center and delivered a Lecture on Ethics in research & academic activities. Hon'ble Vice Chancellor welcome to Prof. Chopra and Dr. Rakesh Kr Singh, Programme Coordinator gave his detail introduction. Dr. Kumari Anjana, Dy. Registrar, AKU, conducted the session.

Prof. Rajeev Sinha, IIT Kanpur visited Nanoscience center of AKU

National Technology Day celebrated-11th May. 2017 at Nanoscience center of AKU.

7.9 Academic Information of Dr. Rakesh Kumar Singh, Asst. Prof.-cum-Head of the Center, Aryabhatta Center for Nanoscience and Technology, AKU

7.9.1 Publication in International/ National Journal/ Proceeding

i. Crystal Structure and Magnetic Property Studies on NanocrystallineLauh (Iron) Bhasma-An Ayurvedic Medicine, Int. J. Ayu. Alt. Med., 2016; 4(1).

ii. Magnetic and Dielectric Properties of Rare Earth Substituted $Ni_{0.5}Zn_{0.5}Fe_{1.95}R_{0.05}O_4$ (R= Pr, Sm & La) Ferrite Nanoparticles, Material Science and Engineering: B, DOI-10.1016/J.mseb,2016.03.011. Elsevier

iii. Some College and University level experiments that foster research driven learning, proceeding, Natn. Conf. Science Education: Issues, Challenges and Strategies- 2016, M. M. College, Patna University.

iv. Evaluation of iron oxide nanoparticles (NPs) on aging and age related metabolism and physiological changes in *C.elegans*. Article ID- IJPSR/RA-7880/02-17, International J. of Pharmaceutical sciences and Research, accepted

v. Study of Ayurvedic Nanocrystalline*Tamra* and *Sankh* Bhasma physical Characteristics by Employing Modern Scientific tools and Applications,ISBN: 978-91-88252-02-9 and DOI: 10.5185/eamc2016, European Advanced Material Congress, Sweden.

vi. A low cost nanotechnological approach for fruits and vegetables processing, © PESB, ISSN 2347 – 4866, May & Dec. 2014, pp 49 - 52

vii. Study on Physical properties of Ayurvedic *Tamra* Bhasma as nanomedicine, J. of Ayurveda and Alternative medicine. DOI.10.1016/j.jaim/2017.03.001.

viii. Tuning of magnetic property by lattice strain in lead substituted cobalt nanoparticles, Materials Science and Engineering B 220 (2017) 73-81, Elsevier

ix. Competition between strain and superexchange mediated Magnetism in modified Cobalt ferrite nanoparticles, Manuscript ID-K-146, American Institute of Physics(AIP), 1832, 130030 (2017), DOI. 10.1063/1.4980750.

x. Low temperature synthesis of hexagonal Barium hexaferrite nanoparticles by annealing at 450^0C followed by quenching, JTAC- Springer, DOI: 10.10007/s10973-017-6247-y.

xi. Magnetic interaction between ferromagnetic Cobalt ferrite nanoparticles and Nickel oxide in Nanocomposite, J. Physica B, Ref. No. PHYSB-D-17-01823R1(accepted)

xii. Effect of high energy ball milling on physic-chemical, structural and morphological studies of Bitter melon Nanopowder. International Journal of Recent scientific Research.8(2017)19258-19263.

xiii. Effect of high energy ball milling on physic-chemical, structural and morphological and optical properties of Curcuma Longa Nanoparticles powders, International journal Pharmaceutical Science and Research.9(2017)1000-06.

xiv. Cytotoxic effect of Nanocrystalline Barium hexaferrite Nanoparticles on multi drug resistant Mycobacterium Tuberculosis, Paper. ID-218, J. IEEE-Xplore

accepted in Nanotechnology for Instrumentation and measurement workshop-An International Conference.

xv. Nanotechnology : A Future for cancer diagnosis and treatment, Patna university Journal.3(2016)65-72.

Books published

xvi. Rakesh Kr Singh & Asheshwar Yadav, Physics of Nanomaterials, Jan 2017, M.Sc, Paper XI of Nalanda Open university, P.05-212.

xvii. Rakesh Kr Singh & Asheshwar Yadav, Statistical Physics, Jan 2017, M.Sc, paper IV of Nalanda Open University,p.05-120.

Currently invited to:

xviii. Write a text book and Working on Ayurvedic Bhasama and Nanomedicine by Limbert Publication, Germany.

International level Research activities AKU faculty felicitated

Recently Young faculty Dr. Rakesh Kumar Singh, Asst. Prof. cum Professor in charge-Establishment, nanoscience center, AKU presented a paper on "Study of Ayurvedic Nanocrystalline *Tamra* and *Sankh* Bhasma physical Characteristics by Employing Modern Scientific tools and Applications" in European Advanced Materials Congress (EAMC)-2016, organized by International Association of Advanced Materials, Linkoping University Sweden, Govt. of Sweden and VBRI Press during 23-25 August 2016 at Stockholm, Sweden. **Prof. S. M. Karim**, Pro VC, AKU and Dr. Manoranjan Kar of IIT Patna is one of the co-author.

Honoured by Executive Chairs of European Advanced Material Congress-2016, at Sweden: Prof. Hisatosi Kobayashi (Left), National Institute for Material Science,Tsukuba, Japan cum President- International Association of Advanced Materials (IAAM) and Prof. Asutosh Tiwari ,Prof. Linkoping University, Sweden.

Dr. Rakesh demonstrating low cost experiment, development by Prof. H. C. Verma, IIT Kanpur in Research inspired science learning session at IIT, Patna (Rashtriya Avishkar Abhiyan Programme imitative of Govt. of India.

7.9.3 Invited Talk /Paper presented/ Lecture delivered/ presentation published

S	Events Name and Topic of paper/Lecture	Date and Venue	Organized/ Invited By
i.	Senior Resource Person meet of Utsahi teachers Anveshika Co-ordinator Annual meet, coordinated by Prof. H.C.Verma, IIT Kanpur and National Anvesika network of India(NANI)- meet-2016, focal theme-Issues of Science education and Revitalization of experiment assisted science teaching and Inspired for Research and Devolvement's (paper presented)	10-12 June 2016 Vivekannad Global University Jaipur , Rajsthan	Siksha Sopan IIT Kanpur NANI
ii.	Presented research paper on Ayurvedic Bhasma and nanomedicine in European Advanced Materials Congress-2016, Stockholm, Sweden	23rd Aug. 2016, Stockholm Sweden	International Association of Advanced materials, Sweden
iii.	Invited talk delivered in UGC sponsored national workshop on the topic " Science education and Converging technologies"	Patna University 12 Aug. 2016	UGC, DST, Govt. of Bihar Sponsored/ P.G, Dept. of Phy, P.U

iv.	Invited talk delivered on Nanoscience & Nanotechnology: frontiers area of science of 21st century and career prospects for engineering graduated	29th March 2017 Chandi Engineering College, Govt. of Bihar	As directed by DST, Govt. of Bihar
v.	National symposium on " Environment & Health-2017, (Paper presentation)	16 Jan 2017 Mahavir Research Center	Mahavir Research Center, Patna
vi.	Presentation reported titled "theoretical implications of lattice thermal conduction – experimental review of dielectric properties in BFN & BFN-ST superlattice nanocubes for use in capacitor" in National Conference on " recent advancement in functional materials and nanotechnology:, NIT Patna	NIT Patna 15-17 Feb. 2017	NIT Patna

Dr. Rakesh, Delivered a Invited Talk on Fundamental Science and Converging Technologies in 21st century in UGC sponsored workshop, at Patna University

7.9.4 Seminars/ Conferences/ Scientific Tour Organized/ Conducted

S.N	Name of the Programme	Date and Venue	Responsible for
1	National Anvesika Network of India-Experimental Skill test-2016, screening, 8th Aug and prelims 14th Aug, 2016	Science College Patna University	Jt. Co-ordinator
2-3	Workshop of Kendriya Vidyalaya PGT teachers of state Bihar, Maharashtra, Chatishgarh **under Rashtriya Avishkar Abhiyan programme- Initiative of Govt.of India, at IIT Patna**	21-23 Oct 2016 **IIT Patna** And 4-6 April 2017	Coordinator and Resource Person

4	National Science day-2017	28 Feb 2017 ACNN, AKU	Coordinator
4-5	Session on Ethics in higher education, by Prof. K. L. Chopra, Former Director, IIT Kharagpur and on Nanoscience by Dr. R.J.Choudhary, UGC-DAE, CSR	17Nov. 2016 And 19 May 2017	Coordinator
5	Debate on the topic " Public participation in promoting integrity and Eradication of corruption, for M.Tech, M.Ed and Ph.D scholar of AKU	26 Oct 2016 ACNN, AKU	Coordinator
6	National programme of Technology Enhanced Learning, (initiative of IIT madras) of AKU	17 Feb 2017 IIT Patna	Nodal officer

Dr. Rakesh participated in Senior resource person(SRP) meet of Utsahi Teachers/ Anveshika Coordinator meet at Vivekanand Global University , Jaipur.(Anveshika/ Senior resource person(SRP) of Utsahi Physics Teachers, coordinated by Prof. H.C.Verma, IIT Kanpur, is group evolved through IIT Kanpur initiative project, working for uplifting Science specially Physics education and creating a vibrant atmosphere of research Inspired learning and Innovative teaching.

Prof. P. Bhattacharya, Director, IIT Patna Felicitating to Dr. Rakesh as a Resource person in Teachers Workshop at IIT Patna in Rashtriya Avishkar Abhiyan programme

7.9.5 Editorial Board member/ Reviewer of Research Journal

I. Journal of Natural product Research, Taylor & Francis

II. Manthan- International Journal

III. IRIS- Journal for Young scientists

IV. Journal – Sankalan

V. Journal of Nanoparticle Research- Springer

- Dr. Rakesh Kr. Singh, Head, Nanoscience Centre, AKU participated in interaction meet with Hon'ble minister, MHRD, Govt. of India and UGC chairman at Pune on 1st Oct. 2017. The Focal theme of this meet was – "Shodh, Shiksha and Samiksha".

7.9.6 Seminars/ Conferences/ Participated

S.No	Detail
1	6th NAGI International Conference, organized by Nalanda Open University, Patna, Date-18-20 Nov. 2016
2	Science & Technology for specially-abled person, Patna University, Date 4th March 2017
3	International Women's Day as a Expert member in a debate on the topic- Scientific temper of women in 21st Century, Organized of S K Science center, Ministry of Culture, Govt. of India, Date- 8th March 2017
4	In Inspired award plan as a expert member, Secondary School students of Govt. of Bihar, SCERT, Patna, Date-14 Nov. 2016
5	Erasmus plus workshop on 8th December 2016 for research exposure programme in European Union country, venue-State higher education council,Govt. of Bihar
6	As a judges in the cluster Level National Children Science Congress-2016 at Jawahar navoday Vidyalaya, Patna, Date-19 Aug. 2016
7	Human Chain of Madya Nished Diwas, 21 Jan 2017, AKU

7.9.7 Member of Scientific/ Professional/ Institutes/ statutory body/ Society and Engage & work for their progress

S.No	Name of the organization / Programme/ Body	Responsibility
1	Ordinance of Post Graduate Diploma in Yogic science of AKU	Member Secretary
2	National Anveshika network of India	Coordinator
3	Vidya Vihar Institute of Technology, Purnea	Governing Body member
4	Indian Association of Physics Teachers	Jt. secretary
5	Bihar Brain development Society	Spokes person
6	Panel member of Innovation Promotion Appraisal committee of BCST-DST, Govt. of Bihar	Expert panel for Innovation in research and Science
7	Post Graduate research Council of School of Engineering and Technology of AKU, Academic Council, Admission committee of AKU	Member
8	Board of studies of Nanoscience and nanotechnology	Convener

S.No	Name of the organization / Programme/ Body	Responsibility
9	New center Astronomy and Astro Physics-establishment	Nodal officer
10	Ordinance of courses, center for River studies, Patliputra School of Economics, AKU	Member
11	Ethical Committee member for PG research in P.G Dept. of Govt. Ayurveda College, Patna	Member
12	Selection committee member of Technical Executive at Incubation center, IIT Patna on 19 Nov 2016	Subject expert-Instrumentation
13	Bihar Disaster Management, Govt. of Bihar	Resource person Group member

7.10. Academic Information of Dr. Anal Kant Jha, Asst. Prof., ACNN

I. Chapters for Book:

Ch.Title : **Fungal Nanotechnology: A Pandora to Agricultural Science and Engineering**
Book Title : Fungal Nanotechnology-Applications in Agriculture, Industry and Medicine
Author : Mugdha Rao, Babita Jha,**Anal K. Jha** and K. Prasad
Publisher : *Springer, Switzerland.* (**2017**), *in print*
Editor : Ram Prasad

Ch.Title : **Fungal Nanotechnology and Biomedicine**
Book Title : Fungal Nanotechnology-Applications in Agriculture, Industry and Medicine
Author : Niraj Kumari,**Anal K. Jha** andK. Prasad
Publisher : *Springer, Switzerland.* (**2017**), *in print*
Editor : Ram Prasad

Ch.Title :**Biosynthetic methods for inorganic nanoparticles: Nature's silent pursuit**
Book Title :Encyclopaedia of Nanoscience and Nanotechnology.
Author :**Anal K. Jha** andK. Prasad
Publisher : *American Scientific Publishers USA.* (**2017**), *in print*
Editor : Hari Singh Nalwa.

II. Research Publications (In International Journals indexed in the UGC List):

1 *Punica granatum* Fabricated Platinum Nanoparticles: A Therapeutic Pill for Breast Cancer, BabitaJha, MugdhaRao, A. Chattopadhyay, A. Bandyopadhyay, K. Prasad and Anal K. Jha, *AIP Conference Proceedings,* (2017) *accepted*.

2 Enhanced Antimicrobial Activity in Biosynthesized ZnO Nanoparticles, NirajKumari, PritiKumari, Anal K. Jha and K. Prasad, *AIP Conference Proceedings,* (2017) *accepted*.

3 *Nyctanthes arbortristis* Mediated Synthesis of Silver Nanoparticles: Cytotoxicity Assay Against THP-1 Human Leukemia Cell Lines, PritiKumari, NirajKumari, Anal K. Jha, K.P. Singh and K. Prasad, *AIP Conference Proceedings,* (2017) *accepted*.

4 Silver Nanoparticles Added PVDF/ZnO Nanocomposites: Synthesis and Characterization, Utpal Singh, NirajKumari, Anal K. Jha, K.P. Chandra, JayantKolte, A.R. Kulkarni and K. Prasad, *AIP Conference Proceedings,* (2017) *accepted*.

5 Electrical Conduction in PVDF/ZnO-Ag Nanocomposites, Utpal Singh, Anal K. Jha, K.P. Chandra, Jayant Kolte, A.R. Kulkarni and K. Prasad, *AIP Conference Proceedings,* (2017) *accepted.*

6 Nanoparticles from kitchen waste (Orange peels): An avenue for conversion of green waste to value added product. Mugdha Rao, Babita Jha and Anal Kant Jha . Vegetos 30 (Supplement) 2017. Doi: 10.5958/2229-4473.2017.00168.9 .

7 Evaluation of Antimicrobial Activity of Silver Nanoparticles Synthesized from *Piper betle* Leaves Against Human and Plant Pathogens. Babita Jha, Mugdha Rao, K. Prasad and Anal K. Jha. *AIP Conference Proceedings,* (2017) *accepted.*

III. Papers accepted for Oral Presentation/Invited lecture in International conferences:

1. Fukuoka, Japan(October, 2017)

Invited Lectures:

- Delivered an invited lecture in the National Seminar on Sustainable Agriculture and Bio-pesticides at S.M. College, Bhagalpur on 12.11.2016.

Doctoral Committee member -Post Graduate Research programme (PGPR) for different affairs of M. Tech and Ph.D programme of ACNN, AKU.

1. Prof. Achintya,	Dean, PGPR
2. Dr. Rakesh Kuamr Singh	Convener
3. Dr. Anal Kant Jha,	Member

7.11. List of Publications of Ph. D Scholar of Aryabhatta Center for Nanoscience and Technology as author/co-author

A. Abhay Kumar Aman (Supervisor- Dr. Rakesh Kr Singh)

1. Crystal Structure and Magnetic Property Studies on Nanocrystalline Lauh (Iron) Bhasma-An Ayurvedic Medicine, Int. J. Ayu. Alt. Med., 2016; 4(1).

2. Evaluation of iron oxide nanoparticles (NPs) on aging and age related metabolism and physiological changes in *C.elegans*. Article ID- IJPSR/RA-7880/02-17, International J. of Pharmaceutical sciences and Research, accepted

3. Study of Ayurvedic Nanocrystalline*Tamra* and *Sankh* Bhasma physical Characteristics by Employing Modern Scientific tools and Applications,ISBN: 978-91-88252-02-9 and DOI: 10.5185/eamc2016, European Advanced Material Congress, Sweden.

4. A low cost nanotechnological approach for fruits and vegetables processing, © PESB, ISSN 2347 – 4866, May & Dec. 2014, pp 49 - 52

5. Study on Physical properties of Ayurvedic *Tamra* Bhasma as nanomedicine, J. of Ayurveda and Alternative medicine. DOI.10.1016/j.jaim/2017.03.001.

6. Competition between strain and super exchange mediated Magnetism in modified Cobalt ferrite nanoparticles, Manuscript ID-K-146, American Institute of Physics(AIP), 1832, 130030 (2017), DOI. 10.1063/1.4980750.

7. Low temperature synthesis of hexagonal Barium hexa ferrite nanoparticles by annealing at 450C followed by quenching, JTAC- Springer, DOI: 10.10007/s10973-017-6247-y.

8. Effect of high energy ball milling on physic-chemical, structural and morphological studies of Bitter melon Nano powder. International Journal of Recent scientific Research. .8(2017)19258-19263.

9. Effect of high energy ball milling on physic-chemical, structural and morphological and optical properties of Curcuma Longa Nanoparticles powders, International journal Pharmaceutical Science and Research.9(2017)1000-06.

10. Cytotoxic effect of Nanocrystalline Barium hexaferrite Nanoparticles on multi drug resistant Mycobacterium Tuberculosis, Paper. ID-218, J. IEEE-Xplore accepted in Nanotechnology for Instrumentation and measurement workshop-An International Conference.

11. Nanotechnology: A Future for cancer diagnosis and treatment, Patna university Journal.3(2015)65-72.

B. Sanjay Kumar (Supervisor- Dr. Rakesh Kumar Singh)

1. Crystal Structure and Magnetic Property Studies on Nanocrystalline Lauh (Iron) Bhasma-An Ayurvedic Medicine, Int. J. Ayu. Alt. Med., 2016; 4(1).

2. Evaluation of iron oxide nanoparticles (NPs) on aging and age related metabolism and physiological changes in *C.elegans*. Article ID- IJPSR/RA-7880/02-17, International J. of Pharmaceutical sciences and Research, accepted

3. Study of Ayurvedic Nanocrystalline*Tamra* and *Sankh* Bhasma physical Characteristics by Employing Modern Scientific tools and Applications,ISBN: 978-91-88252-02-9 and DOI: 10.5185/eamc2016, European Advanced Material Congress, Sweden.

5. Study on Physical properties of Ayurvedic *Tamra* Bhasma as nanomedicine, J. of Ayurveda and Alternative medicine. DOI.10.1016/j.jaim/2017.03.001.

6. Nanotechnology : A Future for cancer diagnosis and treatment, Patna university Journal.3(2015)65-72.

C. Niraj Kumari (Supervisor. Dr. K Prasad-Co-guide and Dr. A.K.Jha- Guide)

1 PAPER ID: 0079, Enhanced Antimicrobial Activity in Biosynthesized ZnO Nanoparticles; AIP (American institute of Physics) conference proceeding ICC-2017.

2. PAPER ID: 211, Lemon grass mediated synthesis of ZnO nanoparticles: Cytotoxicity assay against THP-1 human leukemia cell line; IEEE Transactions on Nanobioscience (Nanofilm 2017).

3. PAPER ID: 0112, Nyctanthes arbortristis Mediated Synthesis of Silver Nanoparticles: Cytotoxicity Assay Against THP-1 Human Leukemia Cell Lines; ; AIP (American institute of Physics) conference proceeding ICC-2017.

D. PRITI KUMARI (Supervisor- Dr. K. Prasad)

1. PAPER ID: 211, Lemon grass mediated synthesisof ZnO nanoparticles: Cytotoxicity assay against THP-1 human leukemia cell line; IEEE Transactions on Nanobioscience (Nanofilm 2017).

2. PAPER ID: 0112, Nyctanthes arbortristis Mediated Synthesis of Silver Nanoparticles: Cytotoxicity Assay Against THP-1 Human Leukemia Cell Lines; ; AIP (American institute of Physics) conference proceeding ICC-2017.

3. PAPER ID: 0079, Enhanced Antimicrobial Activity in Biosynthesized ZnO Nanoparticles; AIP (American institute of Physics) conference proceeding ICC-2017.

E. Mugdha Rao (Supervisor- Dr. A.K.Jha)

1. Nanoparticles from kitchen waste (Orange peels): An avenue for conversion of green waste to value added product, Vegetos-An International Journal of Plant Research, 30:2017. Doi: 10.5958/2229-4473.2017.00168.9
2. A. Chattopadhyay, A. Bandyopadhyay, K. Prasad and Anal K. Jha ;*Punica granatum* Fabricated Platinum Nanoparticles: A Therapeutic Pill for Breast Cancer, AIP (American Institute of Physics) conference proceedings, ICC-2017
3. Jha; Evaluation of Antimicrobial Activity of Silver Nanoparticles Synthesized from *Piper betle* Leaves Against Human and Plant Pathogens, AIP (American Institute of Physics) conference proceedings, ICC-2017.

F. Babita Jha (Supervisor- Dr. A.K.Jha)

1. Paper ID: A-0133, *Punica granatum* Fabricated Platinum Nanoparticles: A Therapeutic Pill for Breast Cancer, AIP (American Institute of Physics) conference proceedings, ICC-2017.
2. Paper ID: A-0402, Evaluation of Antimicrobial Activity of Silver Nanoparticles Synthesized from *Piper betle* Leaves Against Human and Plant Pathogens, AIP (American Institute of Physics) conference proceedings, ICC-2017

3. Nanoparticles from kitchen waste (Orange peels): An avenue for conversion of green waste to value added product, Vegetos-An International Journal of Plant Research, 30:2017. Doi: 10.5958/2229-4473.2017.00168.9