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DR. AKHILESH V. PESHWE
M.A., M.Ed. (UD AUSTIN, USA), LL.B., PhD.
PRINCIPAL
Contact: +91 9422313334
Email: principal_dsc@rediffmail.com

Letter No: DSC/SR/JR/ Date: 31st March, 2023

CERTIFICATE

This is to certify that, the Number of books and chapters in edited volumes/books published and papers published in national/ international conference proceedings per teacher during last five years under Criterion-III (3.3.2) are as follows:

Sr. No.	Year	Number of Books	Chapters in Edited Volumes / Books	Papers Published in National/ International Conference Proceedings	Total Publications
1.	2021-22	02	01	01	04
2.	2020-21	07	02	Nil	09
3.	2019-20	Nil	Nil	Nil	Nil
4.	2018-19	02	Nil	01	03
5.	2017-18	Nil	Nil	Nil	Nil
	TOTAL	11	03	02	16

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Principal

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CRITERION-III

Research, Innovations and Extension

YEAR-1

2021-22

3.3.2

Number of books and chapters in edited volumes/books published and papers published in national/ international conference proceedings per teacher during the years 2021-22

SSR: 2023 FOR NAAC FOURTH CYCLE

DHARAMPETH M. P. DEO MEMORIAL SCIENCE COLLEGE, NAGPUR

3.3.2

Number of books and chapters in edited volumes/books published and papers published in national/ international conference proceedings per teacher during the years 2021-22

List of Books and Chapters in edited Volumes/books Published and Papers published in Conference Proceedings

Sr. No.	Name of the teacher	Title of the book/chapters published	Title of the paper	Title of the proceedings of the conference	National / International	ISBN number of the proceeding	Name of the publisher
1.	Dr. Nitin Gaikwad	Recent Advancements in Science and Technology Research	Modified Theories of Gravitation	NA	National	978-81-950858-9-7	Vidhan Publishing Company, Amravati
2.	Dr. Prashant Ambekar	Advanced Engineering Materials- A Complete Text Book for BE- Sem-II;	NA	NA	National	9788195177271	Alliance & Company, Nagpur
3.	Dr. Mrs. Vaishali Meshram	A text Book of Chemistry Sem IV 2021	NA	NA	National	978-93-5202-424-7	Himalaya Publishing House, Nagpur

4.	Dr. Mrs. Shraddha Deshpande	NA	The study of Role of Rotaract Clubs in granting Incentives and Rewards and promoting Motivation with special reference to McClelland's Theory of Motivation	Proceedings of NAAC Sponsored Seminar on Quality Enhancement and Sustenance measures in Teaching, learning and Assessment	National	978-81-925323	Principal, CP & Berar E S College, Tulsibag, Nagpur

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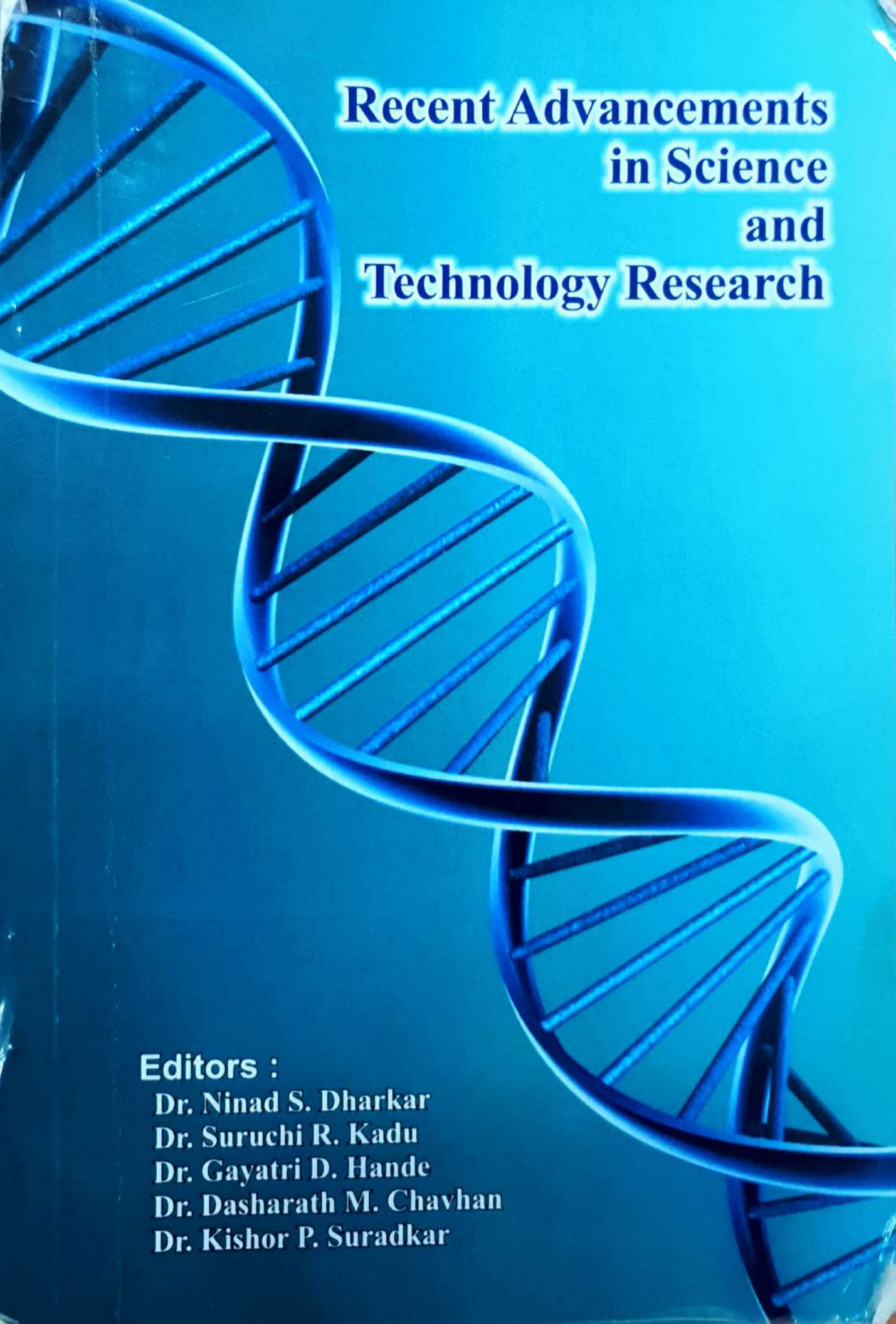

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Dr. Suruchi R. Kadu
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Dr. Kishor P. Suradkar

About the Editors

Dr. Ninad S. Dharkar
M.Sc. Ph.D. F.B.F.I., F.I.S.C.A.
Assistant Professor in Botany at
S.P.M. Science College and Gilani Arts Commerce College Ghatanji
Dist.Yavatmal (MS) India.

Dr. Suruchi R. Kadu
M.Sc., Ph. D. (Botany)
Assistant Professor in Botany at
Brijlal Biyani Science College Amravati (MS) India.

Dr. Gayatri D. Hande
M.Sc., Ph.D. (Zoology)
Assistant Professor in Zoology at
Shri Shivaji Science College Amravati (MS) India.

Dr. Dasharath M. Chavhan
M.Sc.,NET JRF, Ph.D. (Chemistry)
Assistant Professor in Chemistry at
Indira Mahavidyalaya Kalamb Dist.Yavatmal (MS) India.

Dr. Kishor P. Suradkar
M.Sc., NET, Ph. D. (Botany)
Assistant Professor and Head Department of Botany at
Indira Mahavidyalaya Kalamb Dist.Yavatmal (MS) India.

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Content

Chapter - 8

Modified Theories of Gravitation

N. P. Gaikwad
Dharampeth M. P. Deo Memorial Science College, Nagpur
Email: np_gaikwad@rediffmail.com

INTRODUCTION

It is apparent through numerous perceptions and hypothetical realities that our universe is going through a sped-up extension Researchers guaranteed that dark matter and dark energy are behind this development. Modified hypotheses of gravity effectively clarified the account of the undetectable impacts of dark matter and dark energy analyzed different parts of modified relativistic elements and suggested that General Relativity (GR) may be modified to determine various sorts of cosmological issues. It has been observed that our universe contains 76% dark energy and 20 % dark matter. Dark matter is really an obscure type of matter which can't be distinguished in the research centre. The current sped up astronomical extension is the consequence of perceptions, for example, enormous microwave foundation radiations, redshift, Supernovae Type Ia and huge scope structures. These perceptions clarified the job of some baffling powers (that are being liable for the current comic development) behind this astronomical extension. It is believed that modified theories of gravity are very useful to explain the present cosmic expansion. Several mathematical models have been introduced to modify GR with the aim to explore the universe. The most important modified theories have been proposed in the last few

decades. Some of these are f(R), f(G), f (G, T), f (R, T) theories of gravity. where R, G, T and ϕ represents the Ricci scalar, Gauss-Bonnet invariant, trace of the energy-momentum tensor and scalar potential respectively.

Many researchers in different part of the world working on Bianchi Type (I, II, III...IX) Dark energy cosmological model with Modified gravity theory. Recently, the people like, Bhardwaj V. K., Pradhan A **[1]**, Tiwari R. K. et al **[2]**, Das K. and Bharali J. **[3]**, Sofuo˘glu D. et al **[4]**, Shekh S. H., Chirde V. R. **[5]**, Accelerating Bianchi type dark energy cosmological model with cosmic string in f (T) Gravity, Sahoo P.K., Sivakumar M., **[6]**. have been working and examining numerous cosmological models in the general and changed hypothesis of gravity with the impacts of dark energy.

MODIFIED THEORIES OF GRAVITATION

To explore the universe, researchers have studied some different types of modified theories of gravity. Some of which are f (G), f(R), f (G, T), f (R, T), and f (R, ϕ) theories of gravity, where R is the Ricci scalar and G, T and ϕ stand for the Gauss-Bonnet scalar invariant, trace of the energy momentum tensor and scalar potential, respectively. These modified theories are of great importance because they effectively define the mysteries of the moving galaxies and clusters in the universe as alternative to GR. Lobo, F.S.N., Oliveira, M.A. **[7]** explained wormhole solutions in the f(R) gravity and also presented a few exact solutions by considering specific shape functions and several equations of state. Researchers explained symmetric vacuum geometries in f(R) theory of gravity and also discussed solutions in light of solar system constraints in f(R) theories of gravity. Capozziello, S.; Cardone, V.F.; Troisi **[8]** examined spherically symmetric solutions in f(R) theory of gravity by using the Noether symmetric approach. Capozziello, S.; Cardone, V.F.; Troisi **[9]** discussed extended theories of gravity. Sharif M., Ikram A.,**[10]** introduced one of the most prospective and efficient versions of the alternative theories of gravity named as the f (G, T) gravity and also examined energy constraints for the Friedmann-Robertson-Walker (FRW) spacetime. Shamir M. F., Malik A. **[10]** studied the behavior of anisotropic compact stars in f (R, ϕ) theory of gravity. They Shamir M. F., Malik A.**[10]**, also discussed some exact solutions in f (R, ϕ) gravity using FRW universe. Some work related to this theory of gravity has been done in Shamir M. F., Malik A. [10].

The dark energy problem or, why the current universe is expanding with the acceleration, is considered to be one of the most

fundamental theoretical problems of the XXI century. There are various directions aimed to construct the acceptable dark energy model. Specifically, one can mention scalar (quintessence or phantom) models, dark fluid with the complicated equation of state (EoS), more complicated field theories with fermions, abelian or non-abelian vector field, string/M-theory, higher dimensions, etc. Nevertheless, despite the number of attempts still, there is no satisfactory explanation of dark energy origin. This is understandable having in mind that even current values of cosmological parameters are not yet defined with precise accuracy, and even less is known about their evolution.

The modified gravity approach is extremely attractive in the applications for a late accelerating universe and dark energy. Indeed,

i. Modified gravity provides the very natural gravitational alternative for dark energy. The cosmic speed-up is explained simply by the fact of the universe expansion where some sub-dominant terms (like 1/R) may become essential at small curvature.

ii. Modified gravity presents a very natural unification of the early-time inflation and late-time acceleration thanks to the different roles of gravitational terms relevant at small and at large curvature. Moreover, some models of modified gravity are predicted by string/M-theory considerations.

iii. It may serve as the basis for a unified explanation of dark energy and dark matter. Some cosmological effects (like galaxies rotation curves) may be explained in frames of modified gravity.

iv. Assuming that the universe is entering the phantom phase, modified gravity may naturally describe the transition from non-phantom phase to phantom one without the necessity to introduce the exotic matter (like the scalar with wrong sign kinetic term or ideal fluid with EoS parameter less than -1). In addition, often the phantom phase in modified gravity is transient. Hence, no future Big Rip is usually expected there.

v. Modified gravity quite naturally describes the transition from deceleration to acceleration in the universe evolution.

vi. The effective dark energy dominance may be assisted by the modification of gravity. Hence, the coincidence problem is solved there simply by the fact of the universe expansion.

vii. Despite quite stringent constraints from Solar System tests, there are versions of modified gravity which may be viable theories competing with General Relativity at current epoch. Nevertheless, more serious check of such theories.

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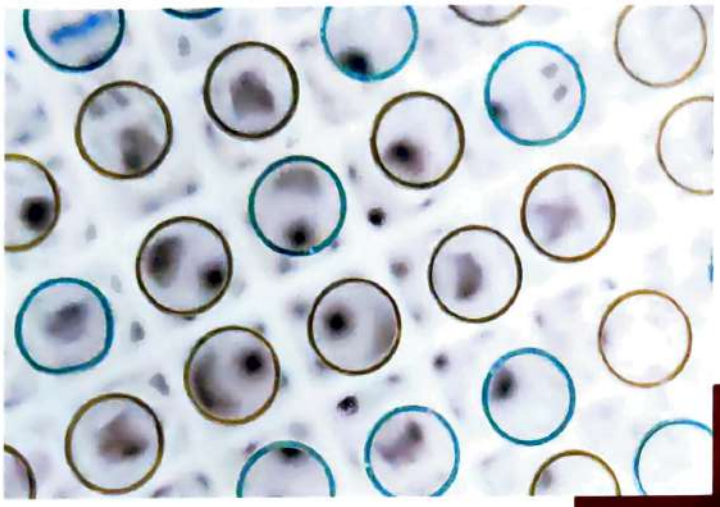

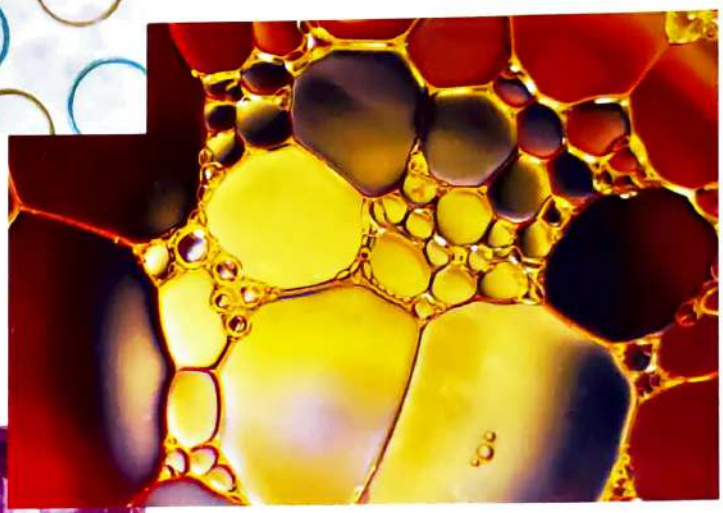

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M. Sc. (Physics), MBA(HR),B.Ed, Ph.D (pursuing)
St. Vincent Pallotti College of Engineering and Technology Nagpur

Dr.Prashant Ambekar
M.Sc. (Physics), M. Phil, Ph.D
Dharampeth M. P. Deo Memorial Science College Nagpur

Dr. Shahin Sayyad
M. Sc. (Physics), B.Ed, Ph.D
Shri Shivaji Science College Amravati

ISBN 978-81-951772-7-1

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ABOUT THE AUTHORS

Dr. Tanveer Quazi, Assistant Professor in Physics, Anjuman College of Engineering and Technology Nagpur, has 15 years of teaching Experience and published 19 research papers in International and national journals and conference proceedings. He has participated and presented 22 research papers in various international and national conferences across India and abroad. He has worked on DRDO research Fellowship, received Visiting Scientist Fellowship- ICTP Federation Scheme (Funded by UNCSCO and IAEA)), Trieste, ITALY and was awarded INSA-DST FELLOWSHIP For SRF(National Science Academy). He has also worked at BARC Mumbai. His area of research includes Physics and Materials Science.

Dr (Ms) Jasmirkaur Randhawa, Assistant Professor in Physics, Government College of Engineering Nagpur has 22 years' experience of teaching Physics at Engineering and M Sc Physics. Her research interests are Electrochemical Gas Sensors, Composite materials and Impedance Spectroscopy. She is recipient of Prof. Suresh Chandra Medal for Best Paper Presented in 4th National Conference on Solid State Ionics, IIT Bombay. She has completed MODROBS project on materials' electrical characterization. She has published 18 research papers in National and International Journals and conference proceedings, an international book chapter and edited a book. She is granted a patent on CO2 sensor.

Ms Uma V. Gaikwad, Assistant Professor in Physics, Priyadarshini Bhagwati College of Engineering Nagpur, has over 18 years of teaching Experience. She has published papers in International, national journal and two book chapters have been published in Apple Academic Press, CRC, Taylor and Francis. She has participated and presented research papers in various international and national conferences across India. Her area of research includes Physics and Materials Science.

Ms. Smita Chandar Tolani, Assistant Professor in Applied Physics, St. Vincent Pallotti College of Engineering And Technology Nagpur is recipient of Ram Chandra Chandurkar Gold Medal, K. L Seth Gold Medal, National Crystallography Award, and P. L Khare Prize in Physics. She has 16 years of teaching experience and number of publications in reputed journals, National/International conferences. She has authored a book and wrote chapters in three reputed national book publications on Physics, Research and Management. She is a columnist and writes for local newspapers. Her areas of interests include Solid State Physics, Materials Science, Vedic Mathematics, HR Management.

Dr. Prashant Ambekar, Assistant Professor in Physics, Dharampeth M. P. Deo Memorial Science College, Nagpur since 2003 has 23 years of research and teaching experience. He has received SRF (Direct Awardee) CSIR, New Delhi a Summer Research Fellowship jointly awarded by IAS, Bangalore, INSA, New Delhi and NASI, Allahabad for three times. He has completed two minor research projects of UGC WRO, Pune and published 21 papers at National/International journals and conferences and authored an international book chapter (Taylor and Francis). He is granted a patent on CO2 sensor. He has designed and developed instruments for UG/PG laboratories. His research interest includes Electrochemical gas sensors, photocatalytic water splitting, DSSCs and nanomaterials.

Dr. Shahin Sayyad, is working as an Assistant Professor with Shri. Shivaji Science College, Amravati. She has teaching experience in Engineering and Science Colleges. He has received MANF National Fellowship for regular Ph.D work. She has published 16 research papers in reputed International and national journals and conference proceeding in India and abroad. One book chapters have been published in Advanced Nanomaterials and Nanotechnology, Springer publication. Her area of research is lead free piezoelectric materials and synthesis of nanomaterials.

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ABOUT THE AUTHORS

Dr. Ajay S. Ghatbandhe, M.Sc., Ph.D. is working at S.F.S. College, Seminary Hills, Nagpur. He is specialized in the area of Inorganic Chemistry and has 18 years of teaching experience. He has 10 National and International research publications and published A Textbook of Chemistry for RTMNU and Gondwana University.

Dr. Arun D. Borkar, M.Sc., M.Phil., Ph.D. is Professor and Head, Department of Chemistry, Nabira Mahavidyalaya, Katol Dist., Nagpur. He is specialized in the area of Physical Chemistry and has 31 years of teaching experience. He has 25 National and International publications to his credit.

Dr. Hemant G. Jahagirdar, M.Sc., Ph.D. is Ex-HOD, Department of Chemistry, S.F.S. College, Seminary Hills, Nagpur. He is specialized in the area of Inorganic Chemistry and has 33 years of teaching experience. He has 14 National and International publications to his credit.

Dr. (Mrs.) Vaishali P. Meshram M.Sc., B.Ed., Ph.D. is Associate Professor and Head, Department of Chemistry, Dharampeth M.P. Deo Memorial Science College, Near Ambazari Garden, Nagpur.

She is specialized in the field of Inorganic Chemistry. She has 19 years of teaching experience. She has published 35 research papers in National and International Journals. She has presented 20 research papers in National and International conference symposia. She is appointed as a honorary member in Referee Board for online International Interdisciplinary Research Journal (ISSN 2249-9598) (Bi-Monthly) Ref. No. 35.

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ISBN No.: 978-81-925323-1-8

The study of Role of Rotaract Clubs in granting Incentives and Rewards and promoting Motivation with special reference to McClelland's Theory of Motivation

Dr. Mrs.Shraddha. Deshpande
Assistant Professor and Head
Department of English
Dharampeth M.P.Deo Memorial Science College North Ambazari Road, Nagpur, Maharashtra
shraddhadeshpande220@gmail.com
Mob: 9860042850

Abstract:
Community development can be an integral part of students' academic life if they are engaged in authentic learning through their involvement in community services. In addition to this, their life skills such as communication, decision making, problem solving, self-awareness, empathy, emotional intelligence, resilience etc, can be developed as they become aware of the local community needs and issues which otherwise, they would have never learned. By enrolling in Rotaract clubs, students can become members and community partners in helping their society's growth. In this paper it is studied how students can be motivated to be enrolled in such community-based clubs and how such affiliations will help them to achieve incentives, rewards and motivation for their future life.

Keywords: Community Learning, Rotaract Club, McClelland Theory of Motivation

Introduction

Students pursuing higher education are in middle and late adolescent age where they are constantly striving to prove their merit. This transition stage shifts their focus from dependency to being independent in terms of planning and execution. Their sense of individuality brings them face to face with challenges in career, relationships and health. A holistic guidance and motivation at this threshold can prove fruitful in order to avoid risks, which they might encounter because of their untimely half-mature impulses. Spending time with friends, improving fellowships, working in collaborations in peer groups are their foremost needs, if when fulfilled, can form steady and binding relationships. Therefore, academic bodies should
be inclined towards engaging undergraduates in tasks that involve them in interactions, leadership, teamwork, and decision-making. Such enterprising activities will motivate them towards achievement, power, and affiliation, as postulated by American psychologist David McClelland in his theory of motivation. McClelland says that, regardless of our gender, culture, or age, we all have three motivating drivers, and one of these will be our dominant motivating driver. This dominant motivator is largely dependent on our culture and life experiences."In the 1960s he explained that, the needs of individuals vary from time to time and do not necessarily be the result of race, age or location. As this study is specially for Indian students, one needs to understand the role of community in shaping the youth of India. Though diversity in language and traditions is the unique identity of India, its value system followed in these diverse communities is one of the strongest of all nations. Even the Indian education system propagates the worthiness of morals and ethics in the development of professionals inculcating human values. Indian education system is the result of an amalgamation of colonial educational structure and the deep-rooted concept of religion and philosophy. Respect for each other, unity in diversity, helping others, rightful conduct and dutiful actions are few values which are a part of Indian curriculum even today.
"It is inspired by the teachings of Swami Vivekananda, who said" Education is the process by which an individual grows, develops and becomes increasingly well-adjusted in an ever-changing society. Education provides experience that enables a person to form desirable habits, broaden mental horizons, deepen understanding of society, and acquire skills to solve problems encountered in day-to-day life. Therefore, the process of education must help an individual to acquire moral qualities, discipline, dedication and devotion to truth. The mind of an educated person should be fearless and

cultured.

Motivation theory of McClelland'

Motivations are primarily separated into two categories: extrinsic and intrinsic. Good news if neither of these gets the job done. Researchers have identified a third type of motivation that's impressively effective. 'Family' has emerged as a third source of motivation, proven to be a strong source of inspiration — even for those who do not feel intrinsically or extrinsically motivated to do something ", opines Brianna Steinhilber in her article in nbcnews.com. In adolescent age, parents and family take a back seat, whereas friends and peers occupy the front ones. Social, cognitive and personal development at this stage is boosted through shared activities with other adolescents, adapting to the concept of homophily. They tend to create personal networks and form core groups based on their distinctive choices they have made

while forming it. They co-evolve, by functioning in small groups, be it knowledge-intensive work or social work; each activity motivates them further to do better in every successive attempt.

McClelland's theory, first principle states, people desire appreciation for their achievements through their performance in a particular field. For example, a student wishes to be known for his academic excellence and wants to be recognized by his teachers for the same. In the same way, students working in groups for a group task or an association strive to prove excellence by involving themselves in innovating and accomplishing new projects. Constant feedback for them is vital, as McClelland's achievement motivation theory suggests, as it "is applicable to people who are comfortable working in a hierarchical system that rewards performance-linked achievements". He also suggested "four characteristics that are consistent with the need for achievement: striving for an average task complexity; responsibility for own performance; the need for feedback, and the use of innovation/creativity."

The second one he laid his opinion on was the need for power. He suggested that one is boosted and motivated when others accept and follow his ideas. This displays his need for authority and he "aims to influence and alter the other person's decision to suit their own wishes". His study also claimed that the need for power influences one to be a good leader. They are adept at managing their own skills and expect others to be disciplined as well. Associations and organizations are a place where these leadership skills can be put to use and fetch them the personal reputation and social standing that they are longing for. The last one of them is the need for affiliation, which shares the same idea as one of the greatest English poets, John Donne's sermons" No man is an Island". This connotes those human beings are social beings who are connected to each other through minor and major communities. This can be achieved through collaborations and alliances pertaining to specific group needs. Friendly and long -term relationships can be formed and maintained, if they follow common goals and intentions. However, affiliations put individuals on secondary stage and focus on joint efforts within a cooperative structure.

What are Rotaract Clubs? What are its goals?

Rotaract brings together adults ages 18-30 to take action in their communities, develop their leadership and professional skills, and have fun. Rotary clubs sponsor them, but Rotaract members manage and fund their clubs independently.

Decoding the secrets of Rotaractors from: 7 things you don't know about Rotaract 1. Rotaractors are experts in their field. 2. They think beyond their clubs 3. They are redefining what it means to be a Rotarian. 4. They excel at recruiting 5. They embrace the opportunity to learn 6. They find creative solutions 7. They know what they want The goals of Rotaract Club of the college are: • To develop professional and leadership skills; • To emphasize respect for the rights of others, and to promote ethical standards and the dignity of all useful occupations; • To provide opportunities for young people to address the needs and concerns of the community and our world; • To provide opportunities for working in cooperation with sponsoring Rotary clubs; • To motivate young people for eventual membership in Rotary.

Research Design Objectives:

1. To observe the development of Life skills among Rotaractors through Rotaract Club activities.
2. To observe the impact of Incentives, Rewards and Motivation among Rotaractors through Rotaract Club activities.

Participants: Students of B.Sc. I, II and III years.

Procedure: Rotaractors participate in and organize various events under the aegis of their Registered Rotaract Club.

Outcomes: Incentives as Achievements

"The incentive theory, sometimes called the Reward Motivation Theory, suggests that motivation is largely fueled by the prospect of an external reward or incentive. The incentive could be tangible (e.g., money) or intangible (praises from someone)." Rotaract Club gives its members an opportunity to achieve something and gets incentives for it. It was observed that, the four members of the club achieved incentives in the form of deduction in the annual fees
of the coming year by the institution for their outstanding contribution as volunteers for Nagpur Municipal Corporation during second and most threatening wave of Covid. Registration fee for camp for deserving members was contributed by the Parent club, Rotary Club of Nagpur Downtown as an appreciation of their participation in the club activities. One of the students got an opportunity to attend a Rotaract Conference as his registration fees were contributed by the Institute. Students' dedication and hard work in conducting events instigated the Parent Club to sponsor their events motivated them to do better in the coming event. All these incentives, the members received in different forms marked their achievement in the present and for the future, too.

Rewards as Power:

A registered Rotaract Club gets an opportunity to prove its merit according to activities the club has conducted during an academic session. A competitive spirit is developed as these Rotaractors from different districts contest each other for scoring points and eventually winning awards for their respective clubs. A score sheet is designed and developed every year, displayed to clubs, who then strive hard to score maximum marks to reach, to stand in the list of top ten clubs among all. When the awards are won, the power of the club is unveiled and the legacy of doing good work is carried forward. The power increases as the number of awards, if taken positively, it influences coming generations. The college club bagged District Rotaract Representative Citation, RID 3030 with Platinum distinction, and was recognized for the participation in district project Nirmalya Collection for Rotaract District Council of RID for R.Y .2019-20. In the subsequent year 2020 -21, the club once again received Rotary Citation by President, Rotary International. The members also clinched the awards given by the Parent Clubs. Apart from awards, four Rotaract Board of Directors got special recognition from the Department of Higher Education, Ministry of Education, Government of India, for their philanthropic contribution as member of Beat Covid Campaign initiative of Mahatma Gandhi national Council of Rural Education, Hyderabad. These members counseled the pandemic-stricken citizens by attending their phone calls and providing them beds in hospitals for admission. This experience made the members feel capable and authoritative to execute such important and crucial tasks with great responsibility and power.

Motivation for Affiliations

The new face of technology has changed or minimized the interaction between humans, yet the need for companionships and social life, formal or informal, remains the same. "Alone we can
do so little; together we can do so much," said Helen Keller, and seems very appropriate, as everyone's desire can be accomplished if carried out in collaboration. The synergy of people with common aims and goals, when utilized effectively, results in success and motivates the team to build more mutually supportive affiliation goals. There are certain initiatives which require sustainable objectives and need suitable manpower; especially in such cases, a tangible outcome can be sought through proper affiliation. When different clubs work on one project, ideas, resources and workforce are exercised in a heterogeneous manner. If the delegation of work is done appropriately and evenly, each member is benefited and empowered through a competitive spirit within the group. Rotaract club of the college

organized various activities in collaboration with different clubs as a host as well as a participant. Each such opportunity proved an impetus to the members, as their internal and external communication improved, leading to more partnerships. While they hosted webinars or organized competitions, the work was efficiently distributed among the participating clubs in such a way, it maintained the hierarchy and compassion among the peers. Hosting events with other clubs, created better leaders, who were self- motivated to display empathy and were more concerned with other's acceptance.

Conclusion Among all the theories of motivation, McClelland's theory helped the institute identify members needs and how they could be motivated through gaining achievements, acquiring power, and winning affiliations. It was observed that the students who became members in their first semesters continued till their final semesters, attaining leadership roles in subsequent years. Initially the members were less in number and knew less about the working of the Rotaract Club, but eventually they were motivated towards their commitment to society by doing smaller projects. When the club was officially registered and the point system was introduced, it provoked a sense of competitor ship and changed their approach from a general to a more goal-oriented behaviour. Thereafter, each member envisioned the club as an assemblage and started working towards achieving excellence through intellectual and experiential novelty. As Jiddu Krishnamurti rightly pointed out, "There is no end to education. It is not that you read a book, pass an examination, and finish with education. The whole of life, from the moment you are born to the moment you die, is a process of learning. The club has given them a learning environment where they are happily and willingly contributing to social and community causes. The consistent efforts made by the club members had won them

accolades not only form parent club but also from government agencies and citations as forms of incentives, rewards and motivation at different levels.

Recommendations "Success is no accident. It is hard work, perseverance, learning, studying, sacrifice and most of all, love of what you are doing or learning to do," Pele opined. As students are interested in doing extracurricular activities along with academics, they should be motivated to do so. The importance of intrinsic motivation is at par with an extrinsic one. The combination of both, if put to use, can bring about comprehensive progress in the personality of an individual. The paper makes a sincere and thoughtful recommendation regarding engaging students in community enhancement activities through such clubs. Introduction of community clubs and registering them on an official platform will motivate the members to enhance their life skills through social work. These real time projects will give them a chance to identify the problem, analyze the possible solutions, and create a vision for solving it. Institutes of higher education should acquaint their learners to Rotaract Club activities, and should register it, which will give, the student as well as the institute a distinct identity on a global platform. Once the club is registered, it should study and understand the scoring system and plan their activities accordingly. The role of Teacher – in charge of the club also is pivotal, as students' needs guidance in certain areas such as communication, teamwork, decision making, and execution. Under the appropriate guidance of the facilitator, the members are motivated to face competitive situations and utilize their potential to overcome their shortcomings. In the whole process, the Contractors achieve different stages of self-actualization through "curiosity; creative living, and fulfilling work, is not necessarily attained or attainable by all humans".

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Number of books and chapters in edited volumes/books published and papers published in national/ international conference proceedings per teacher during the years 2020-21

List of Books and Chapters in edited Volumes/books Published and Papers published in Conference Proceedings

Sr. No.	Name of the teacher	Title of the book/chapters published	Title of the paper	Title of the proceedings of the conference	National / International	ISBN number of the proceeding	Name of the publisher
1.	Dr. Mrs. Vaishali Meshram	A text Book of Chemistry Sem I 2020	NA	NA	National	978-93-5097-950-1	Himalaya Publishing House, Nagpur
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9.	Dr. Prashant Ambekar	Chemical Methods for Processing Nanomaterials edited by Dr. V. N. Singh, NPL New Delhi and published by Taylor & Francis, CRC Press, Oca Raton; London; New York	Quantum Dots and Their Synthesis Processes	NA	International	978036708588 9	Taylor & Francis, CRC Press, Oca Raton; London; New York

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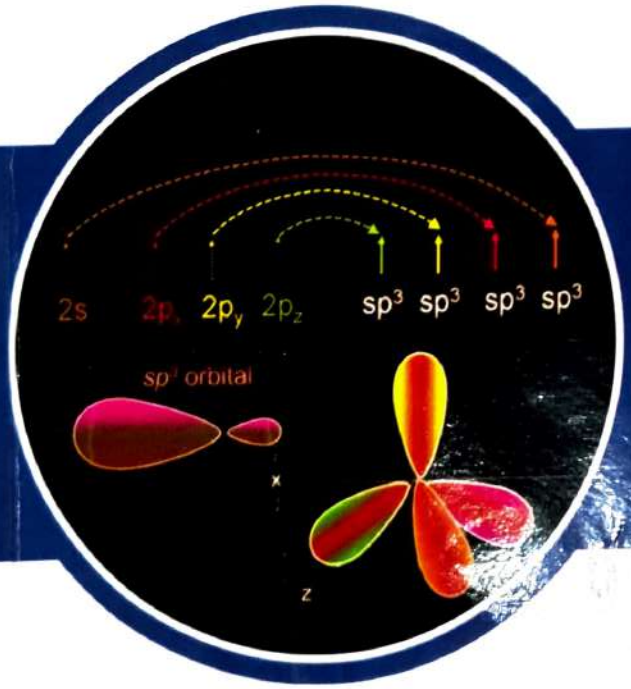

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ABOUT THE AUTHORS

Dr. Arun D. Borkar

M.Sc., M.Phil, Ph.D. is Head, Department of Chemistry, Nabira Mahavidyalaya, Katol Dist., Nagpur. He is specialized in the area of Physical Chemistry and has 31 years of teaching experience. He has 25 National and International Publications to his credit.

Dr. Ajay S. Ghatbandhe

M.Sc., Ph.D. is working at S.F.S. College, Seminary Hills, Nagpur. He is specialized in the area of Inorganic Chemistry and has 18 years of teaching experience. He has 10 National and International research publications and A Textbook of Chemistry for RTMNU and Gondwana University.

Dr. Mrs. Vaishali P. Meshram

(M.Sc., B.Ed., Ph.D.) is Assistant Professor at Dharampeth M.P. Deo Memorial Science College, Near Ambazari Garden, Nagpur.

She is specialized in the field of Inorganic Chemistry. She has 19 years of teaching experience. She has published 35 research papers in National and International Journals. She has presented 20 research papers in National and International conference symposia. She is appointed as a honorary member in Referee Board for online International Interdisciplinary Research Journal (ISSN 2249-9598) (Bi-Monthly) Ref. No. 35.

Dr. Hemant G. Jahagirdar

M.Sc., Ph.D. is Ex-HOD, Department of Chemistry, S.F.S. College, Seminary Hills, Nagpur. He is specialized in the area of Inorganic Chemistry and has 33 years of teaching experience. He has 14 National and International Publications to his credit.

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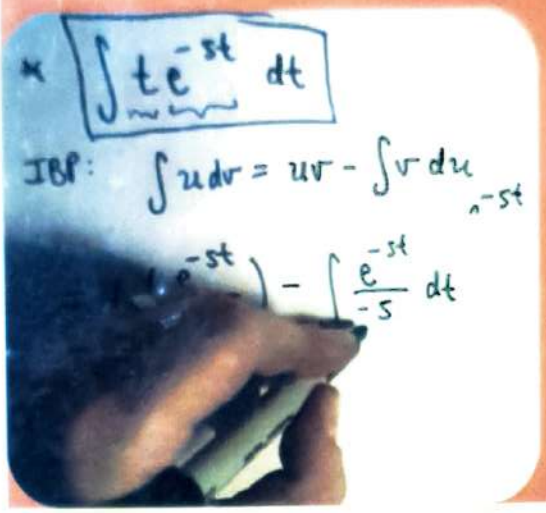

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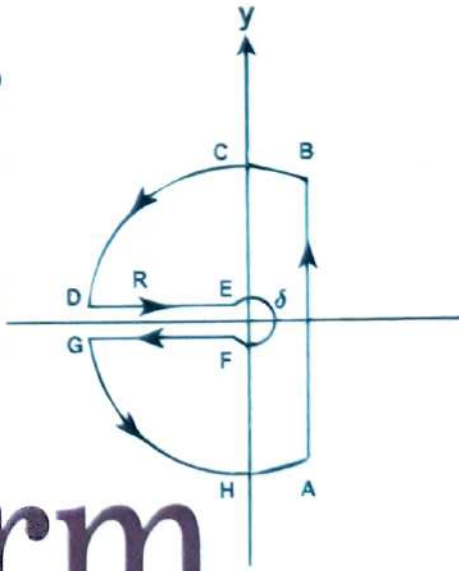

$$\mathcal{L}\{f(t)\} = F(s)$$

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N. P. Gaikwad (M.Sc., M.Phil., Ph.D.) Assistant Professor & Head in the Department of Mathematics at Dharampeth M.P. Deo Memorial Science College, Nagpur. He has 14 years of teaching experience to taught undergraduate and postgraduate students. He is participated and presented research papers in national and international conference. His research papers published in reputed national and international journals. He has authored one book in the subject Mathematics. He is also the coordinator and counselor of Yashwantrao Chavan Maharashtra Open University, Nashik (Study Center No. 44366). He is working on various committees of RTMNU & YCMOU.

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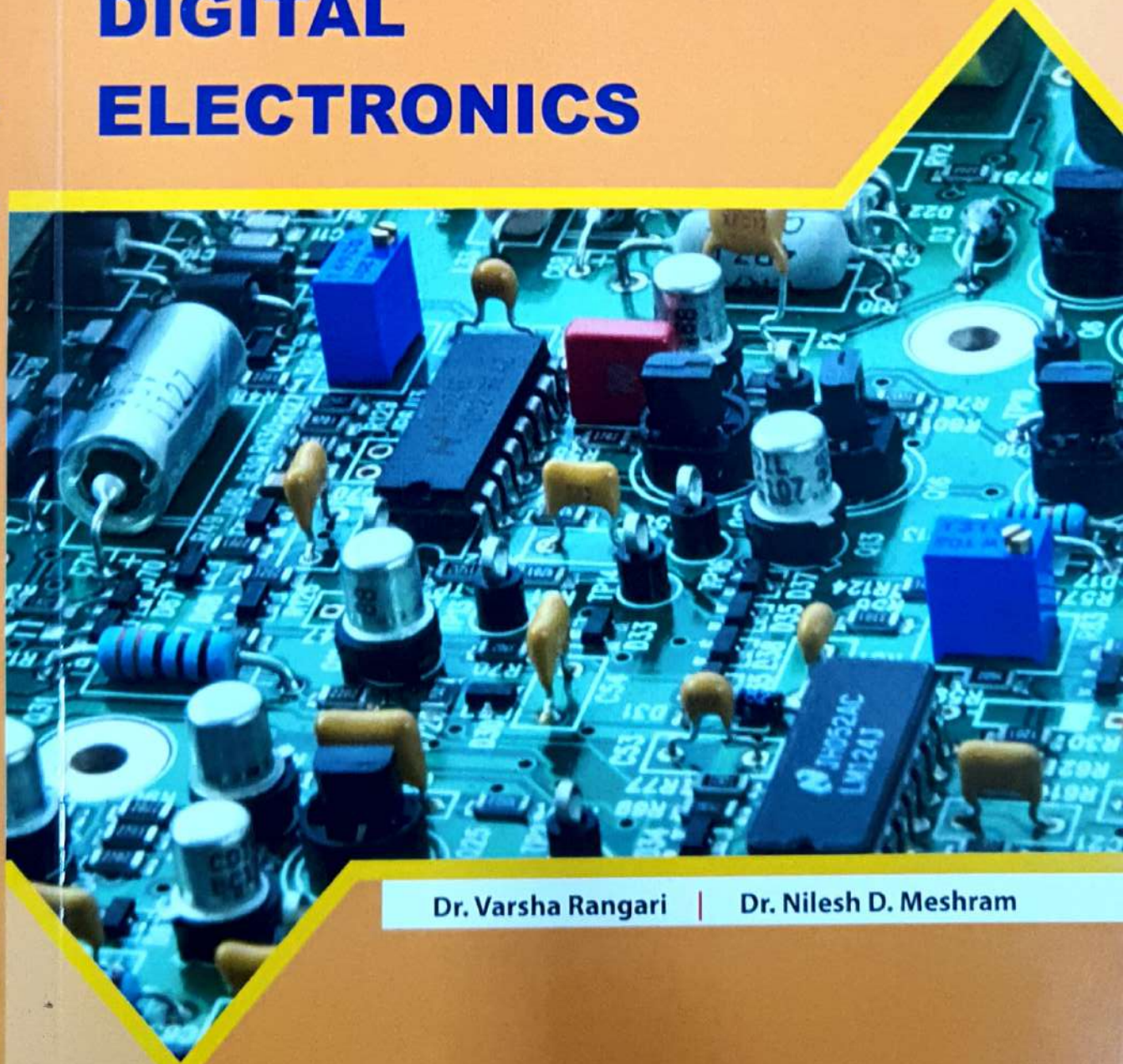

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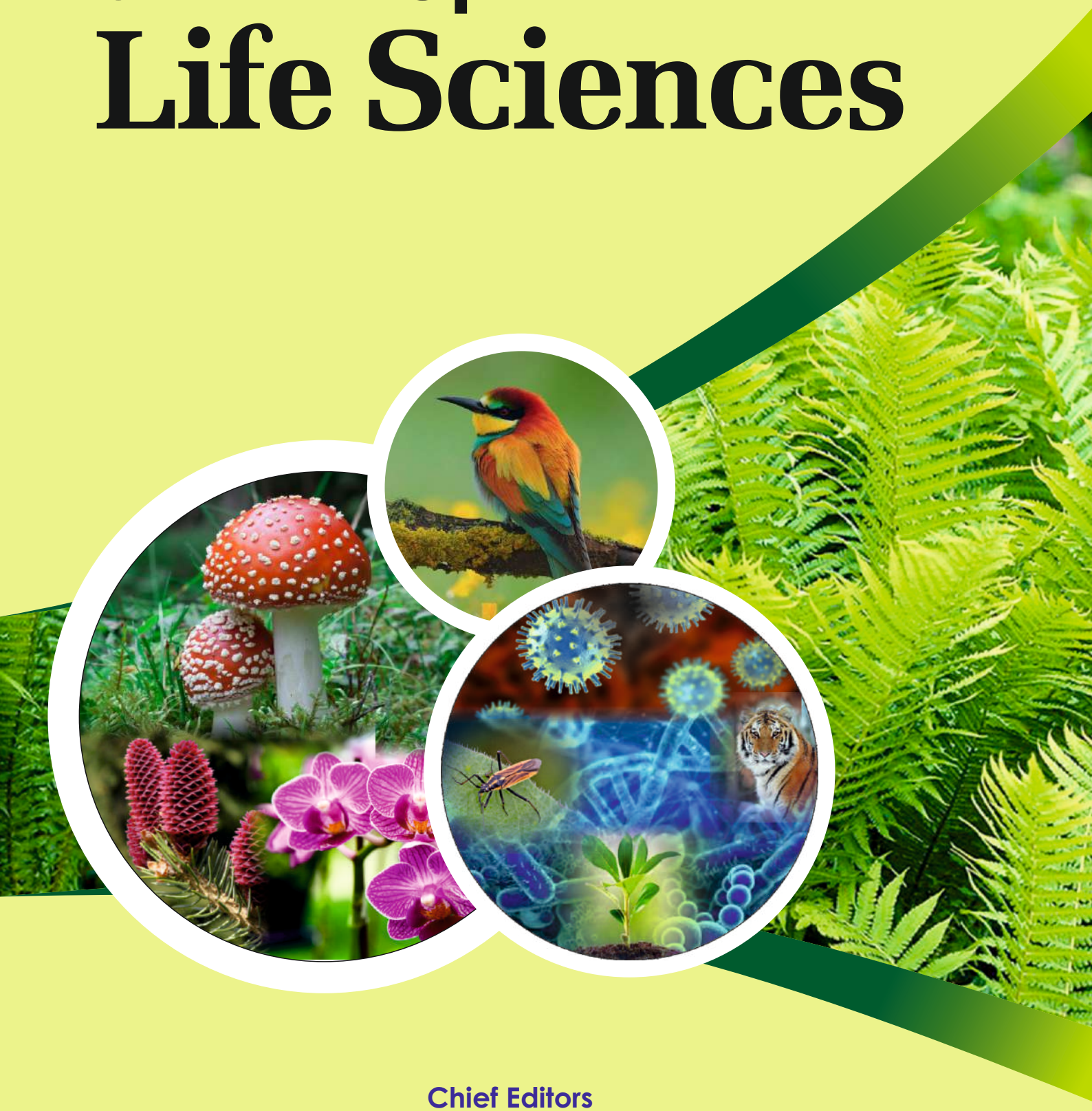

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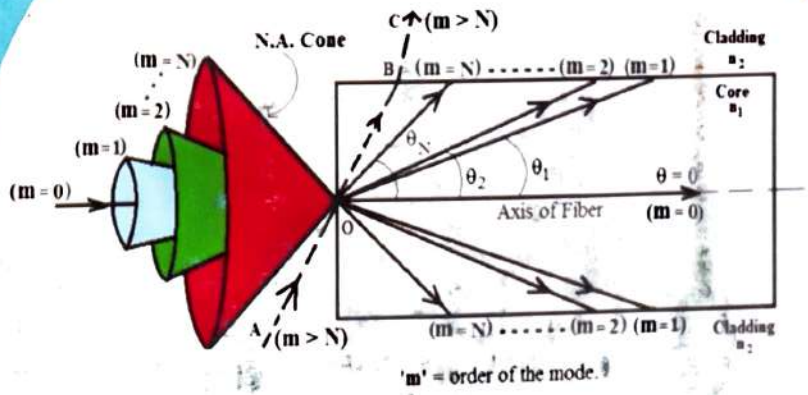

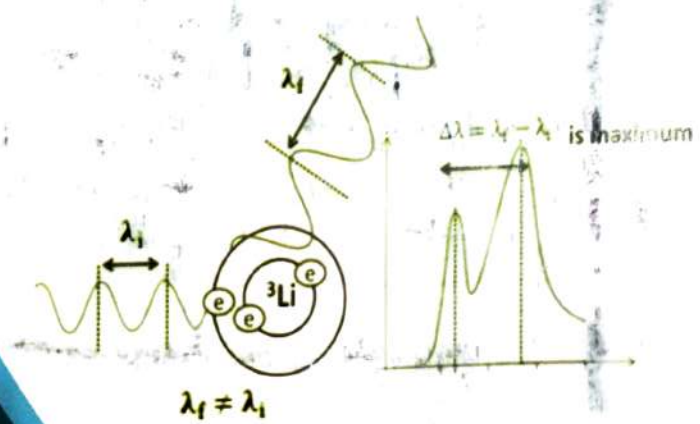

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Dr. Tanveer Quazi, Assistant Professor in Physics, Anjuman College of Engineering and Technology Nagpur, has 15 years of teaching Experience and published 19 research papers in International and national journals and conference proceedings. He has participated and presented 22 research papers in various international and national conferences across India and abroad. He has worked on DRDO research Fellowship, received Visiting Scientist Fellowship- ICTP Federation Scheme (Funded by UNCSCO and IAEA)), Trieste, ITALY and was awarded INSA-DST FELLOWSHIP For SRF (National Science Academy). He has also worked at BARC Mumbai. His area of research includes Physics and Materials Science.

Dr (Ms) Jasmin Assistant Professor in Physics, Government College of Engineering Nagpur has 22 years' experience of teaching Physics at Engineering and M Sc Physics. Her research interests are Electrochemical Gas Sensors, Composite materials and Impedance Spectroscopy. She is recipient of Prof. Suresh Chandra Medal for Best Paper Presented in 4th National Conference on Solid State Ionics, IIT Bombay. She has completed MODROBS project on materials' electrical characterization. She has published 18 research papers in National and International Journals and conference proceedings, an international book chapter and edited a book. She is granted a patent on CO2 sensor.

Ms Uma V. Gaikwad, Assistant Professor in Physics, Priyadarshini Bhagwati College of Engineering Nagpur, has over 18 years of teaching Experience. She has published papers in International, national journal and two book chapters have been published in Apple Academic Press, CRC, Taylor and Francis. She has participated and presented research papers in various international and national conferences across India. Her area of research includes Physics and Materials Science.

Ms. Smita Chandar Tolani, Assistant Professor in Applied Physics, St. Vincent Pallotti College of Engineering And Technology Nagpur is recipient of Ram Chandra Chandurkar Gold Medal, K. L Seth Gold Medal, National Crystallography Award, and P. L Khare Prize in Physics. She has 16 years of teaching experience and number of publications in reputed journals, National/International conferences. She has authored a book and wrote chapters in three reputed national book publications on Physics, Research and Management. She is a columnist and writes for local newspapers. Her areas of interests include Solid State Physics, Materials Science, Vedic Mathematics, HR Management.

Dr. Prashant Ambekar, Assistant Professor in Physics, Dharampeth M. P. Deo Memorial Science College, Nagpur since 2003 has 23 years of research and teaching experience. He has received SRF (Direct Awardee) CSIR, New Delhi and Summer Research Fellowship jointly awarded by IAS, Bangalore, INSA, New Delhi and NASI, Allahabad for three times. He has completed two minor research projects of UGC WRO, Pune and published 21 papers at National/International journals and conferences and authored an international book chapter (Taylor and Francis). He is granted a patent on CO2 sensor. He has designed and developed instruments for UG/PG laboratories. His research interest includes Electrochemical gas sensors, photocatalytic water splitting, DSSCs and nanomaterials.

Dr. Shahin Sayyad, is working as an Assistant Professor with Shri. Shivaji Science College, Amravati. She has teaching experience in Engineering and Science Colleges. He has received MANF National Fellowship for regular Ph.D work. She has published 16 research papers in reputed International and national journals and conference proceeding in India and abroad. One book chapters have been published in Advanced Nanomaterials and Nanotechnology, Springer publication. Her area of research is lead free piezoelectric materials and synthesis of nanomaterials.

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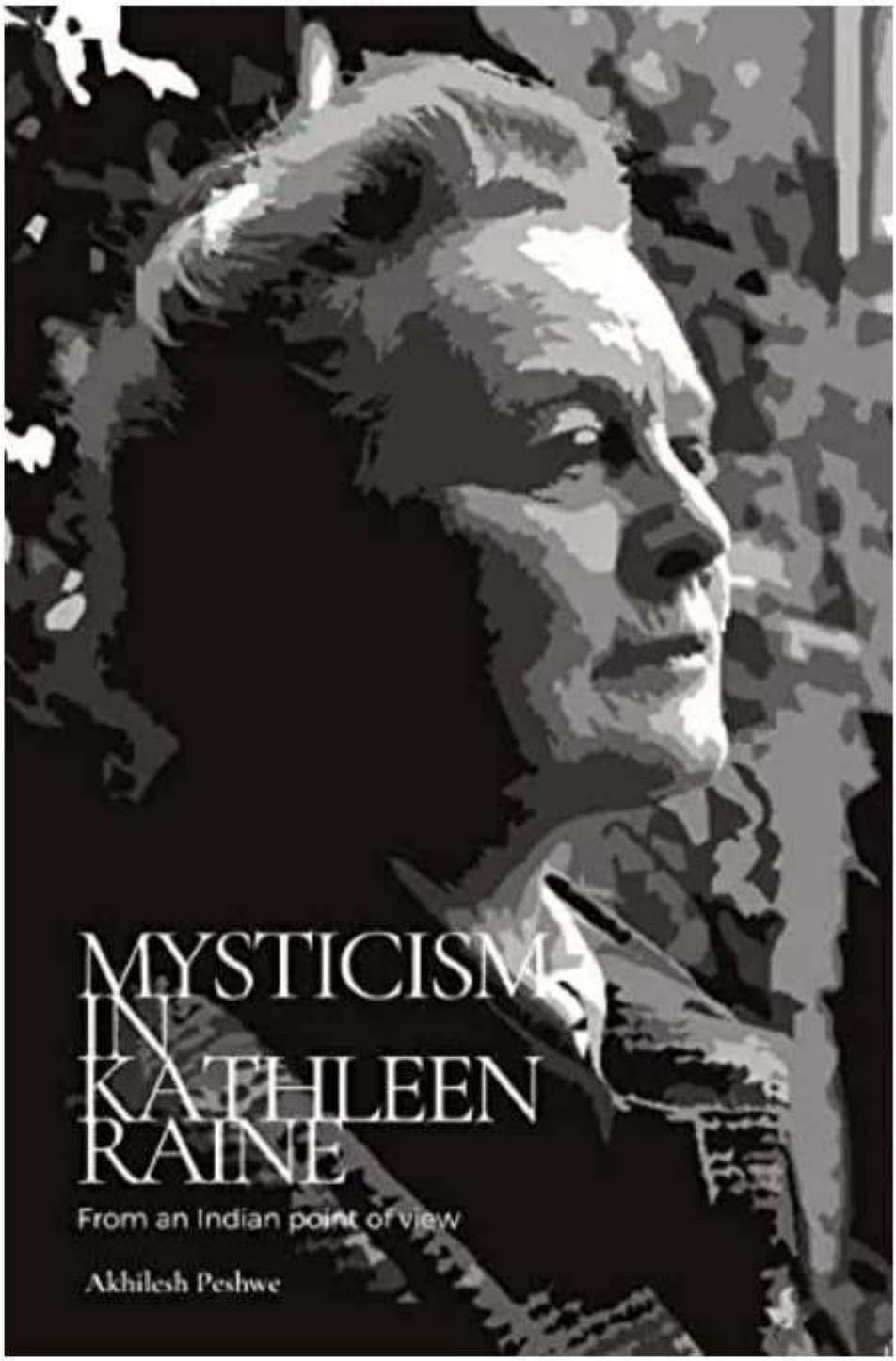

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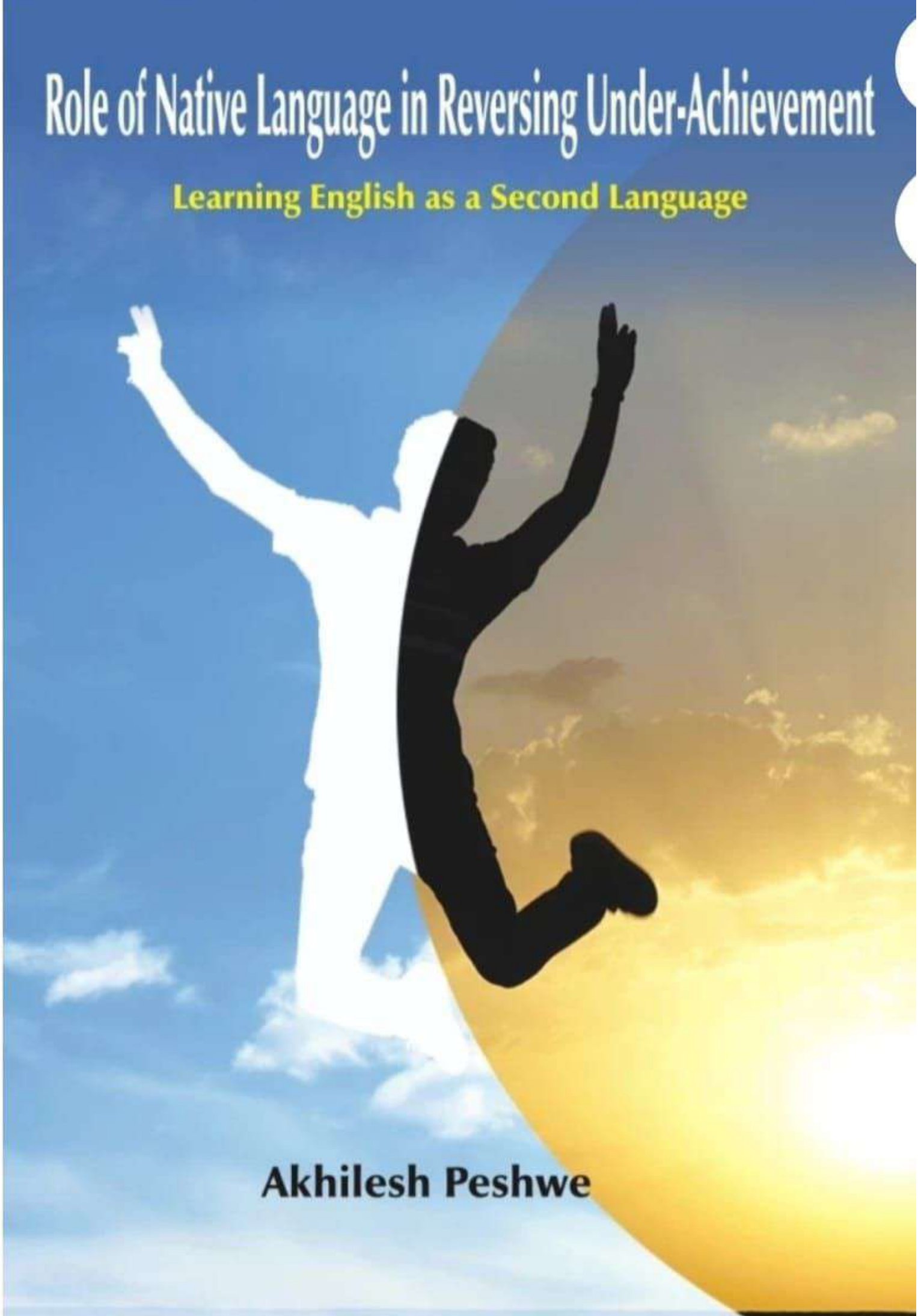

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Editor

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CRC Press
Taylor & Francis Group
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Taylor & Francis Group, an **informa** business
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Cover images provided by the editor of the book.

First edition published 2021
by CRC Press
52 Vanderbilt Avenue, New York, NY 10017

and by CRC Press
2 Park Square, Milton Park, Abingdon, Oxon, OX14 4RN

CRC Press is an imprint of Taylor & Francis Group, LLC

Library of Congress Cataloging-in-Publication Data

```
Names: Singh, Vidya Nand, 1976- editor.
Title: Chemical methods for processing nanomaterials / editor, Vidya Nand
   Singh.
Description: First edition. | Boca Raton : CRC Press, Taylor & Francis
   Group, 2021. | Includes bibliographical references and index.
Identifiers: LCCN 2020029168 | ISBN 9780367085889 (hardcover)
Subjects: LCSH: Nanostructured materials.
Classification: LCC TA418.9.N35 C479 2021 | DDC 660/.282--dc23
LC record available at https://lccn.loc.gov/2020029168
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ISBN: 978-0-367-08588-9 (hbk)

Typeset in Times New Roman
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Preface

The purpose of this book is to summarize the recent developments in the important research field of "Chemical Processing of Nanomaterials". Book chapters were invited on different methods for fabricating nanomaterials. Finally, the book is being published with fourteen chapters. The topics are focused on chemical methods for processing nanomaterials. The target audience of change the proposed with this book is academia and researchers in the universities and the research laboratories. Nearly 15% of researchers in different area deal with nanomaterials, and among them 60–70% of them employ chemical methods for processing nanomaterials. The present book gives various aspects of chemical processing of nanomaterials. This book describes latest synthesis methods for all kinds of nanostructures using various chemical methods. It also describes the latest techniques used for synthesizing and characterizing nanomaterials of several kinds, such as active groups, core-shell, quantum dots, metal and metal oxide, perovskite nanocrystals, etc. The chapters deal with chemical methods for chalcogenides, nanostructured materials using microemulsions, wet chemical methods for nanomaterial synthesis, chemical vapor deposition method, sol-gel processing of nanocrystalline metal oxide thin films, electrodeposition—a versatile and robust technique for synthesizing nanostructured materials, synthesis of nanomaterials and nanostructures, low dimensional carbon nanomaterials, synthesis and applications of two dimensional materials, methods of manufacturing composite materials, surface modification of nanomaterials, nanomaterials for gas sensing applications and the synthesis process of the quantum dots.

I would like to thank all those who have kindly contributed chapters for this book. Thanks are also due to Dr. Prashant Ambekar and Dr. Jasmirkaur Randhawa for their help in finalizing and improving the contents of the book.

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Dr. Akhilesh Peshwe
Principal

DHARAMPETH M. P. DEO MEMORIAL SCIENCE COLLEGE,
North Ambazari Road, Near Ambazari Lake, Nagpur

NAAC ACCREDITED GRADE 'A' WITH CGPA 3.01 (Third Cycle)

CRITERION-III

Research, Innovations and Extension

YEAR-4

2018-19

3.3.2

Number of books and chapters in edited volumes/books published and papers published in national/ international conference proceedings per teacher during the years 2018-19

SSR: 2023 FOR NAAC FOURTH CYCLE

DHARAMPETH M. P. DEO MEMORIAL SCIENCE COLLEGE, NAGPUR

3.3.2

Number of books and chapters in edited volumes/books published and papers published in national/ international conference proceedings per teacher during the years 2018-19

List of Books and Chapters in edited Volumes/books Published and Papers published in Conference Proceedings

Sr. No.	Name of the teacher	Title of the book/chapters published	Title of the paper	Title of the proceedings of the conference	National / International	ISBN number of the proceeding	Name of the publisher
1.	Dr. Prashant Ambekar	NA	Under Ground Irrigation System for Water Deficit Farming	Water Conservation' role of educators	National	978-93-80985-20	Swaprakashan Publication Cell, LAD & SRP College for Women, Nagpur
2.	Dr. Mrs. Snehal Narale	Programming in C	NA	NA	National	9789382683414	M./s. Rajani Prakashan
3.	Dr. Mrs. Vaishali Meshram	Textbook of Chemistry Sem III	NA	NA	National	818917866-0	Central Techno Publications, Nagpur

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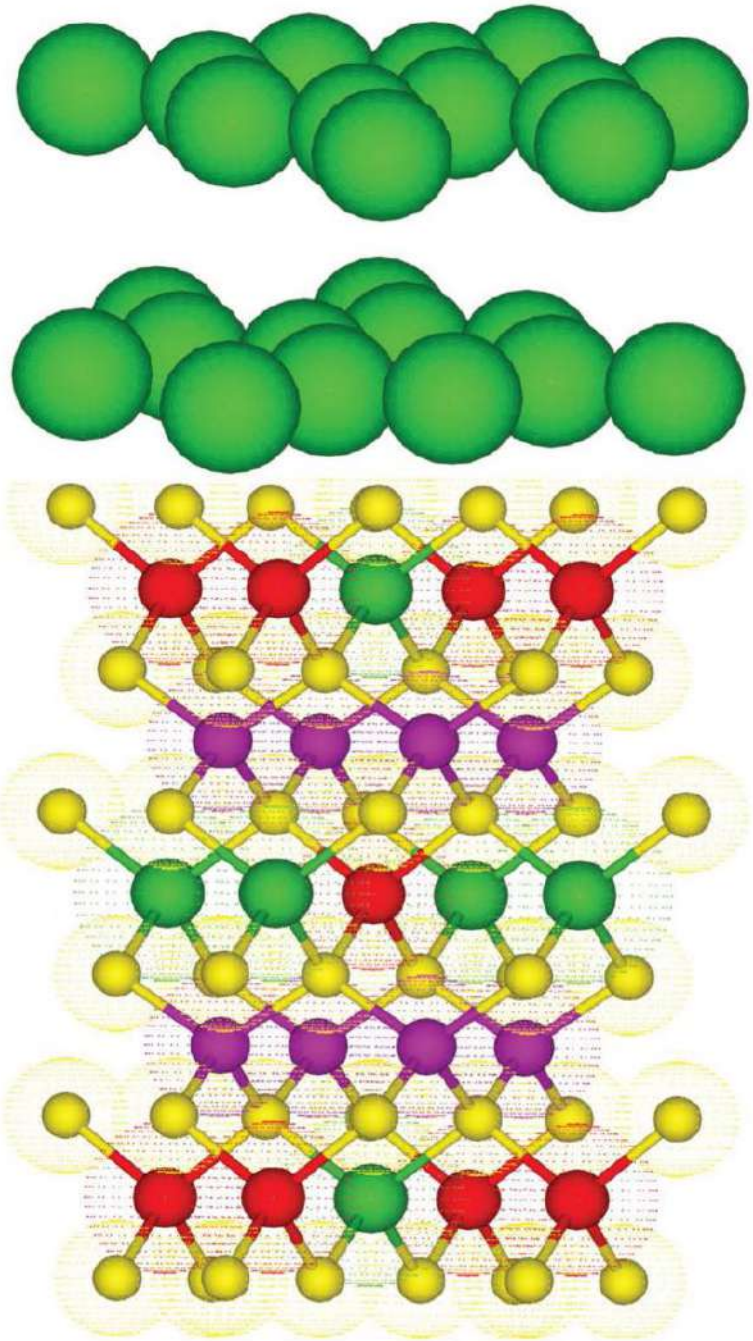
Chemical Methods for Processing Nanomaterials

Vidya Nand Singh (*ed.*)



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Chemical Methods for Processing Nanomaterials

Editor

Vidya Nand Singh

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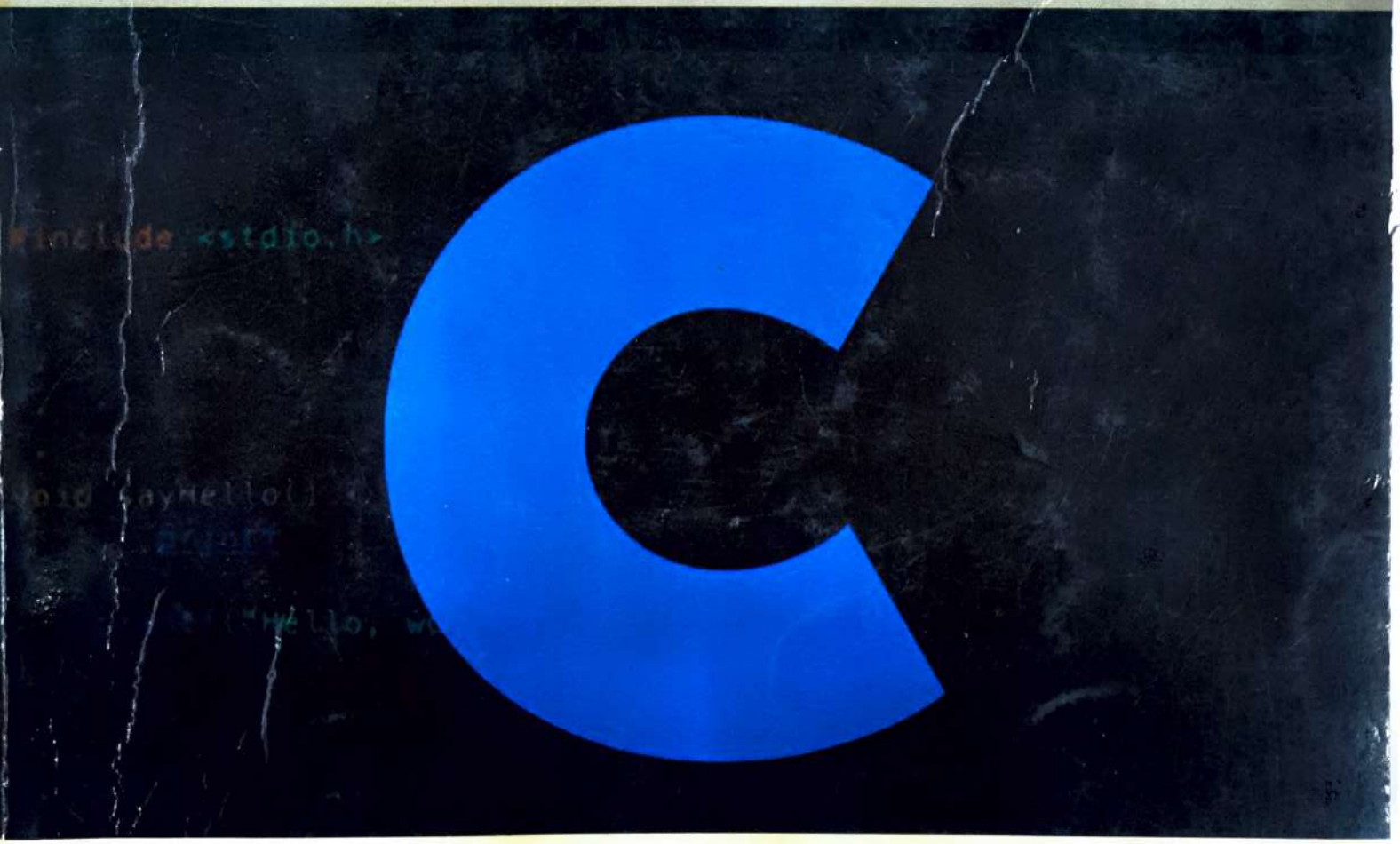

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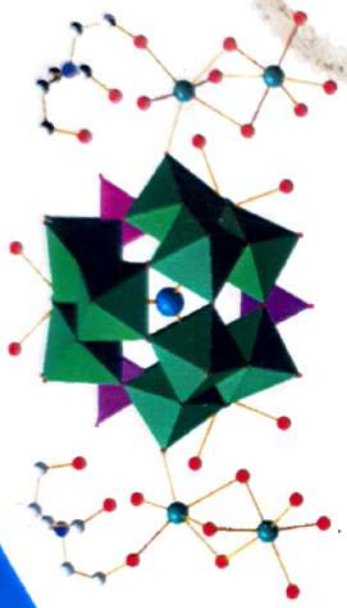

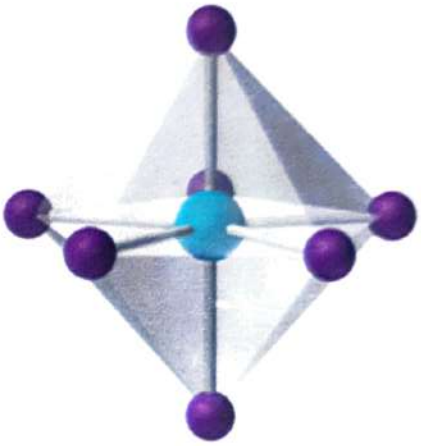

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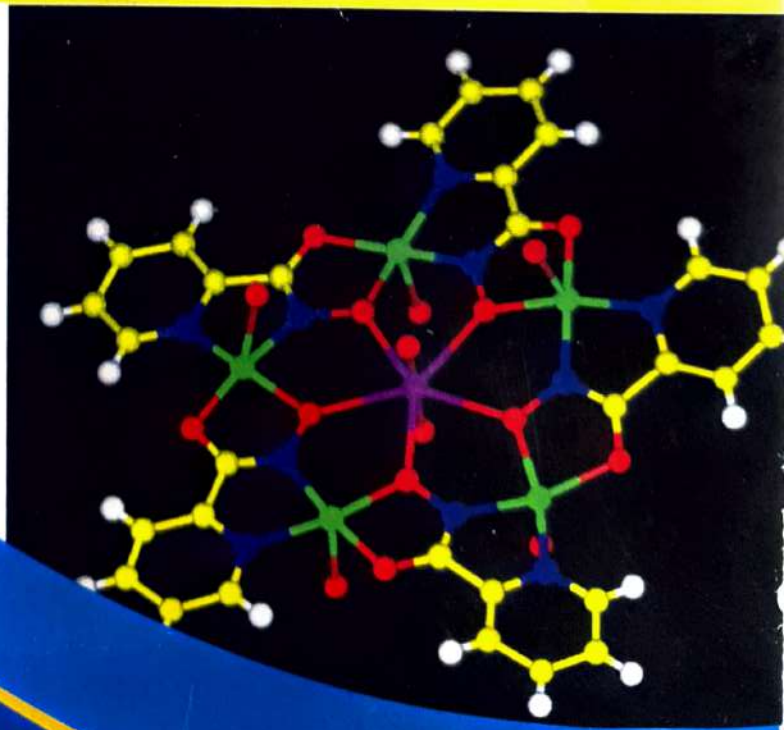

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About the Author.....

Dr. R. D. Raut (M.Sc., B.Ed., PhD.)
He is working as Associate Professor at J.B. College of Science, Wardha. He has 29 years Teaching experience in In-Organic Chemistry. He has published 4 books and 48 research papers in national and international journals. He has completed 4 research project of U.G.C. 7 students awarded Ph.D and 3 M.Phil under his guidance. He is a member of various bodies in RTM Nagpur University. He is a Ex-Chairman board of studies in Chemistry RTM Nagpur University. Author can be contacted for suggestions at ravishankar.raut@gmail.com

Dr. Mrs. Vaishali P. Meshram (M.Sc., B.Ed, Ph.D)
She is Assistant Professor at Dharampeth M.P. Deo Memorial Science College, Near Ambazari Garden, Nagpur. She is specialized in the field of Inorganic Chemistry. She has 17 years of teaching experience. She has published 38 research papers in National and International Journals. She has presented 20 research papers in National and International conference symposia. She is appointed as a honorary member in Referee Board for online International Interdisciplinary Research Journal (ISSN 2249-9598) (Bi-Monthly) Ref. No. 35. Author can be contacted for suggestions at vaishali296@rediffmail.com

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23 Farmland, New Ramdaspeth,
Central Bazar Road, Nagpur - 440010 (MS)
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DHARAMPETH M. P. DEO MEMORIAL SCIENCE COLLEGE,
North Ambazari Road, Near Ambazari Lake, Nagpur

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CRITERION-III

Research, Innovations and Extension

YEAR-5

2017-18

3.3.2

Number of books and chapters in edited volumes/books published and papers published in national/ international conference proceedings per teacher during the years 2017-18

SSR: 2023 FOR NAAC FOURTH CYCLE

Dharampeth Education Society's
DHARAMPETH M. P. DEO MEMORIAL SCIENCE COLLEGE
Near Ambazari Lake, North Ambazari Road, Nagpur 440033 (MS)
Contact: +91 712 2241372 / 2241490 Fax: +91 712 2241125
www.dharampethscience.com
NAAC ACCREDITED - A GRADE (3.01)

DR. AKHILESH V. PESHWE
M.A., M.Ed. (UD AUSTIN, USA), LL.B., PhD.
PRINCIPAL
Contact: +91 9422313334
Email: principal_dsc@rediffmail.com

Letter No: DSC/SR/JR/ Date: 31st March, 2023

3.3.2 Number of books and chapters in edited volumes/books published and papers published in national/ international conference proceedings per teacher during the years 2017-18

NIL

AKHILESH VASANTRAO PESHWE
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Dr. Akhilesh Peshwe
Principal