1. Biodata

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Prof M. Sai Baba comes with extensive experience working in diverse institutes, a premier research institute (Indira Gandhi Centre for Atomic Research (IGCAR), Department of Atomic Energy (DAE)), a premier think tank organisation (National Institute of Advanced Studies, NIAS, Bengaluru) and a relatively young university (Ramaiah University of Applied Sciences, RUAS, Bengaluru) run by a foundation with more than 60 years of experience.

Prof Sai Baba is an accomplished researcher, scientific administrator, and institutional builder. He has made significant contributions to implementing several high-impact activities relevant to IGCAR and the DAE. He has contributed to diverse domains, including Human Resource Development, Access to scientific information resources, Financial Management, Workflow Automation to move towards a paperless office, Technology Transfer, and Intellectual Property Rights. One of his significant contributions has been establishing the BARC Training School at IGCAR and steering its programs until his superannuation. Held several key positions at HBNI and played an important role in streamlining the processes of HBNI from its beginning.

Information in some detail:

1. *Education:*

- Master's degree in chemistry from Andhra University (1977-79)
  Winner of Prof. Nil Rathan Dhar Prize in Physical Chemistry.
- Doctoral Degree from the University of Madras
  (PhD work at IGCAR, Kalpakkam).
- Post-doctoral work at:
  (i) Texas A&M University, College Station, Texas, USA (1996-1997)
  (ii) Research Centre, Julich, Germany (1997-1998)

2. *Academic and Administrative Positions:*

- Associate Professor, Professor and Senior Professor, Homi Bhabha National Institute (2006-2017)
- Principal Scientist, Energy Program, School of Natural Sciences, National Institute of Advanced Studies (2017-2018)
- Shri TV Raman Pai Chair Professor, National Institute of Advanced Studies (2018-2020)
- Professor at Ramaiah University of Applied Sciences (2020 to 2023)
- Visiting Professor, National Institute of Advanced Studies (January 2020 to present)
- Member of the Editorial and Scientific Committee of the International Journal of Nuclear Knowledge Management, published by Inder Science Publishers (WONUC) (current)
- Member of the Advisory Board, Governing Council of Hindustan Institute of Maritime Training Group of Educational Institutions, Chennai, run under the Shri Krishna Educational Trust, Madhulika Educational and Charitable Trust, HIMT College Trust & HIMT Offshore (current)

Positions Held

- Director, Centre for Professional Development and Training, Ramaiah University of Applied Sciences, Bengaluru.
- Registrar, Ramaiah University of Applied Sciences, Bengaluru.

- Member of NEP task force, Ramaiah University of Applied Sciences, Bengaluru.
- Chairman of the Committee formed to assess and optimise the human resource requirements of the non-teaching and administrative workforce at Ramaiah University of Applied Sciences, Bengaluru.
- Member, Elsevier Advisory Panel.
- Member of the Editorial Board of "Frontiers in Science, Technology and Application".
- Member, Journal Advisory Board (JAB) of "Frontiers in Science, Technology and Application".
- Adjunct Professor: PSG College of Technology, Coimbatore and Amrita University, Coimbatore.
- Adjunct Professor: Amrita University, Coimbatore.
- Member of the Executive Council of the Academy of Sciences, Chennai.
- Member, Focus Group on the World Institute of Nuclear Security (WINS) Academy Training Course for STE.
- Member, Working Group on "Science Communication Policy: Focus Karnataka".
- Member, Board of Studies of School in Physical & Nuclear Chemistry and Chemical Oceanography, Andhra University.
- Member, Board of Studies of Library and Information Sciences, University of Madras.

At Indira Gandhi Centre for Atomic Research, DAE (Kalpakkam)

- Director, Resources Management Group, IGCAR
- Head, Strategic Planning and Human Resources Division
- Head, Scientific Information Resources Division
- Head, BARC Training School at IGCAR
- Senior Professor, HBNI
- Dean (Student Affairs) of HBNI at IGCAR
- Coordinating Dean of HBNI at IGCAR
- Official Spokesperson of IGCAR
- Member to coordinate NIRF and NAAC for HBNI at IGCAR
- Participated in Indo-French, Indo-Japanese, Indo-US and Indo-Russian collaboration and coordinated the discussions at IGCAR
- Coordinated DAE-IAEA collaboration projects at IGCAR

Work at Institutes Outside of India

- Visiting Scholar at Centre for Nuclear Security Science and Policy Studies, Texas A&M University, Texas, USA, April to May 2023.
- Visiting Scientist at Research Centre, Julich, Germany in 2000
- Visiting Scientist at Nuclear Research Centre (KFA), Julich, Germany, during 1988-1989, under Indo-German Bilateral Collaboration.

3. Management Contributions:

- Served as a member of all the decision-making bodies of the Indira Gandhi Centre for Atomic Research, which included:
  (i) the Scientific Committee of Indira Gandhi Centre (IGCSC)
  (ii) Directors Advisory Committee (DAC)

(iii) Stores & Purchase Committee (SPC)
(iv) Indira Gandhi Centre Council (IGC Council) (the highest governing body of the Centre)

- Served as a member of the Kalpakkam Management Committee
  (The governing body is responsible for all the activities at the townships at Kalpakkam and Anupuram.)
- Served as a member of the Management Committee of the General Services Organisation, Kalpakkam
  (responsible for the construction and maintenance of the Kalpakkam and Anupuram Townships and managing the hospitals).
- Served as a member of the Hospital Advisory Committee for hospitals at Kalpakkam.
- Provided commendable leadership in providing considerable ease of access to Scientific Information Resources, catering to the various needs of researchers and a large community of students. Employed Innovative and advanced information technology principles to provide users access to information resources at IGCAR.
- E-governance towards paperless office: Instrumental in implementing workflow automation (ATOMS) at IGCAR to aid in moving toward a paperless office. A user-friendly interface for data management related to personnel, administration, accounts, purchases, and stores has received broad appreciation. Some of the DAE units have already implemented the same. It is poised for adoption by other DAE units.
- Served as the Chairman of the Library and Information Science Committee, responsible for identifying the information resources required for IGCAR and allocating the budget for subscribing to and procuring the journals, databases, and books.
- Served as a committee member at the DAE level, responsible for finalising the agreement for a consortium with Elsevier.
- Served as a member of the "Complaints Committee" constituted to investigate the sexual harassment-related complaints at IGCAR, Kalpakkam.
- Served as a Member and subsequently as Chairman of Value Engineering Committees constituted to streamline and optimise the purchase and utilisation of procurement
  (a) Chemicals, laboratory equipment and (b) library and information resources.
- Provided leadership in enhancing the "Technology Transfer and Intellectual Property Rights" activities at IGCAR. Served as Chairman of the Committee dealing with Intellectual Property Rights and was Co-Chairman of the cell for Technology Transfer and Intellectual Property Rights.
- Convener of the "Neighbourhood Development Program" at Kalpakkam, a program initiated to contribute to the development of the villages in the neighbourhood. The program aimed to uplift the quality of life in surrounding villages through better education, healthcare, infrastructure, and community development.
- Contributed to establishing Kalpakkam Community Radio as part of the neighbourhood development program.
- As the "official spokesperson", interacted with the local public, students, and the media, organising exhibitions and lectures to dispel people's doubts and fears about nuclear energy.
- Served as Vice Chairman of the Local Management Committee of Atomic Energy Education Society Schools (three) at Kalpakkam and Anupuram.
- Served as a member of committees constituted by the Chairman of the Atomic Energy Education Society, an autonomous unit of the Department of Atomic Energy, Mumbai, to discuss issues relating to governing the schools of the Atomic Energy Education Society. A Cadre Review of the Administrative cadre of the Atomic Energy Educational Society is one of them.

- Member of several professional bodies and served as Vice-president of the Indian Society for Mass Spectrometry (outside Headquarters) for six years and as an executive committee member for several years.

4. Institution Building and Academic Management

- **BARC Training School at IGCAR**: Made outstanding contributions to realise the dream of starting the BARC Training School programmes at IGCAR. Played a pivotal role in formulating academic content, including the commencement of three new disciplines: Nuclear Reactor Physics, Nuclear Fuel Cycle Chemistry and Materials Science. He has made commendable efforts to realise the necessary infrastructure for the Training School and the hostels in a record period. Eleven batches graduated from the training school, and the 12th batch was undergoing training (at the time of superannuation).

- **Research Scholars at IGCAR**: Played a significant role in formulating the procedures and implementing the Homi Bhabha National Institute (HBNI) programmes at IGCAR from its inception. He has played a pivotal role in creating the necessary ambience for research scholars at the Centre and Hostels.

- **Contributions to HBNI at IGCAR**
  - Convener of the Apex coordination committee is responsible for organising HBNI activities at IGCAR.
  - Served as a Member of the Standing Committees of Engineering, Physical and Chemical Sciences of HBNI at IGCAR.
  - Convener of the Standing Committee of Engineering Sciences of HBNI at IGCAR.
  - Coordinator of HBNI at IGCAR for providing inputs required for NAAC and coordinated the visits of the NAAC team to IGCAR.
  - Coordinator of HBNI at IGCAR for providing inputs for NIRF.
- Served as a member of:
  - Board of Studies of Chemical Sciences, HBNI
  - Board of Studies on Applied Systems Analysis, HBNI
  - Board of Studies of the Department of Library and Information Sciences of the University of Madras
- Served as Convener of the committees responsible for the selection of:
  - Research Associates (post-doctoral fellows)
  - Visiting Scientists
- Served as Chairman of the committees for the selection of research scholars from the disciplines:
  - Nuclear Science &Technology
  - Library and Information Science
- Served as the Convener of the committee responsible for allocating research projects to the scholars joining the Centre to pursue their doctoral programmes with HBNI.
- Convener of the committee responsible for assessing the suitability of applicants from IGCAR to pursue higher studies at reputed academic institutes like IIT and IISc.
- Convener of the committee with the mandate to assess the collaborative projects seeking funds under BRNS from various agencies.

- One of the nodal persons to interact regarding M. Tech programmes in Nuclear Engineering at various academic institutes, including IIT-Madras, UPES Dehradun, PDPU Gandhinagar, University of Delhi, and Mody University, Lakshmangarh, Rajasthan.

5. Assessment of projects, monitoring, and advising:

- Member of GINSERV Incubator Seed Management Committee (ISMC).
  The committee evaluates Startup Seed fund applications under the Startup India Seed Fund Scheme.
- Led the group at IGCAR that contributed towards formulating the capital projects for getting funds under the five-year plan projects (XI and XII). Monitoring physical and financial progress and providing input to various monitoring agencies are two crucial assignments his group executes under his leadership.
- Served as a member of some of the Specialist Groups constituted by the Secretary, DAE, to assess and evaluate the new capital projects of all the DAE units.
- One of the key persons representing IGCAR in various forums to obtain approvals within the DAE and with the Planning Commission/NITI Aayog.
- Participated in Indo-French, Indo-Japanese, Indo-US and Indo-Russian collaboration and coordinated the discussions at IGCAR
- Coordinated DAE-IAEA collaboration projects at IGCAR.
- Coordinated with academic institutions in carrying out R&D projects.
- Member of a high-level S&T Institutional & Human Capacity Building committee, constituted by DST, Government of India.
- Member of the Committee of Experts constituted by DST to review research activities of the policy research centres.
  Suggested some new initiatives/modalities and discussed further strengthening and making future roadmaps in the country's STI sector.
- Member of the Expert Committee, UGC- SERO, Hyderabad, Constituted by UGC, Government of India.
- Served as a reviewer of the projects submitted to DST.
- Reviewer of AWSAR: Expert for evaluating the articles submitted to DST's science communication initiative 'Augmenting Writing Skills for Articulating Research (AWSAR)' by PhD Scholars and Post-Doctoral Fellows for the AWSAR Prize.
- Currently a member of the External Research Recognition Committee (RRC) of the School of Sustainability Studies, Department of Public Health, MIT-World Peace University, Pune, Maharashtra, India.

6. Publications:

Co-authored **66** Journal publications, **181** papers in symposiums/conferences, **4** confidential reports (IGCAR), and **3** NIAS reports. Authored **12** chapters in Books/Proceedings. Edited **9** Books/Periodicals. **20** papers have won best paper awards.

- Scopus: H-index: 19, i-10 index: 34, Average citations per paper: 18.6
- Web of Science: H-index: 19, i-10 index: 28, Average citations per paper: 18.8
- Google Scholar has an H-index of 22, an i10 index of 40, and over 1,280 citations.
- ResearchGate: More than 1.6 lakh reads and >1000 citations, h-index of 20

Appeared in Media (16) and Invited talks and Panel Discussions (269).
(Details are given in a separate file being sent.)

7. Guiding Students:

Five students obtained their PhD under his guidance. Currently guiding one student as a co-guide. Two students have done their MTech under his guidance. Guided several UG and PG students for their project work, including those from BITS Pilani.

8. Membership of *Professional* Bodies:

Life Member of:

- The Indian Society of Mass Spectrometry
  Member of the National Executive Committee of the Indian Society of Mass Spectrometry (ISMAS) (for several years). Also held the position of Vice-President (Outside Headquarters).
- The Indian Vacuum Society of India
- Materials Research Society of India
- Indian Association of Nuclear Chemistry and Allied Sciences
- Madras Library Association (MALA)
- Kalpakkam Chapter of MALA
  (served as President of the same for several years)

9. Editorial Contributions

- Member of the editorial committee of 9 Books/Proceedings.
- Chairman of the Editorial Committee of:
  (i) IGC Newsletter (quarterly publication)
  (ii) IGCAR Annual Report.

10. Invited Talks

Chaired sessions and delivered invited talks at the Nuclear Energy Summits held in Mumbai for a few years. Delivered several invited talks (>270) on diverse topics, and notable among them are the following:

- Technology Management
- Technology and Innovation
- Startup ecosystem
- Human Reliability
- Science and Risk Communication
- Access to Information in the Digital Era
- Technical Writing
- Self-motivation for Enhanced Performance
- Human Resource Development
- High-Temperature Chemistry and Thermodynamics
- Library and information sciences
- Atomic Energy for Energy Security and Enhancement of Quality of Life

11. Organising Seminars and Conferences:

Took an active part in the organisation of many Seminars and Conferences, some of which are:

1. The Bi-annual "Recent Advances in Information Technology (READIT)" (2009,2001,2013, and 2016)
   Chairman of the Organising Committee
2. Mass Spectrometry in the Fuel Cycle
   Convener
3. Convener of the Institute Lecture series at Indira Gandhi Centre for Atomic Research, like (a) IGC Colloquium (b) Sarabhai Lecture (c) Homi Bhabha Lecture
4. Played an important role in organising several ISMAS Mass Spectrometric Conferences and Workshops

In the recent past:

At NIAS:

1. At NIAS, coordinated the NIAS-DST training programme on "Science & Technology: Global Developments and Perspectives", 2018 and 2019.
2. Discussion meeting on "Human Reliability Program (HRP) in Industries of National Importance."
   NIAS and Texas A&M University jointly conducted a discussion meeting with technical support from ORNL, USA, from April 24 to 26, 2019.
3. Six core group meetings on the "Human Reliability Program (HRP) in Industries of National Importance" were conducted during 2019-2023.
4. Discussion Meeting on "Handling Nuclear and Other Radioactive Materials with Indian Security Agencies", 4-6 December at NIAS
5. Two workshops on "Handling Nuclear and other Radioactive Materials with Indian Security Agencies" were jointly organised by NIAS and Amity (March 25 and November 25).
6. Discussion Meeting on "Communicating Ancient Indian Knowledge System for the Holistic Development of the School Students for their Physical, Mental and Spiritual Well-being" Organised from 7-8 May 2019 at NIAS. It is an NIAS and Chinmaya Vishwa Vidyapeeth, Ernakulam initiative, with support from the SATYAM programme, DST.

12. Projects undertaken in the recent past:

1. *DST Project:*
   Managing Public Perceptions and Public Acceptance of Public Risks Associated with New and Emerging Technologies Through Science and Technology Communications
2. BRNS-sanctioned project:
   Determinants of Nuclear Risk Perception in India: An Integrated Analysis.
3. A NIAS-Texas A&M University collaborative project.
   The work on the "Human Reliability Program (HRP) in Industries of National Importance" is a collaborative effort between NIAS and Texas A&M University.
4. Ancient Indian Knowledge System for the Holistic Development of School Students.
   A three-day and a two-day discussion meeting was organised with financial support from DST.
5. Capacity Building: Nuclear and Radiological Safety and Security (ongoing)
   Oak Ridge National Laboratory, USA-funded project

13. Awards:

1. Winner of **Prof. Nil Rathan Dhar Prize** in Physical Chemistry for the course of Master's in Chemistry, Andhra University, Visakhapatnam
2. Conferred **Doctor of Science (Honoris Causa)** by Dr MGR University, Education and Research Institute
3. **DAE Group Achievement Award:** Member of the Team that won the award for contributions to "Collaborative Research Coordination under BRNS and Outreach Activities for Human Resource Development
4. **Fellow** of the **Academy of Sciences, Chennai**, **Tamil Nadu**
5. **Best Paper Awards:** Many of the research papers (twenty) co-authored have won Best Paper Awards

14. Research work carried out at Indira Gandhi Centre for Atomic Research, Department of Atomic Energy:

I. Mass Spectrometry, High-Temperature Chemistry and Thermodynamics:

A key member of the team that established and nurtured the research in mass spectrometry and High-Temperature chemistry at the Chemistry Group (IGCAR) to international acclaim. Established a new experimental programme to measure equilibrium vapour pressures by the transpiration method based on Thermogravimetry at IGCAR. Research work on Fullerenes was highly appreciated. First, to report the partial pressures of fullerenes and the electron impact ionisation cross-section of Buckminster fullerenes (C_{60} and C_{70}).

a) **Thermodynamic Studies on understanding Fuel-clad interactions in fast reactors**: Conducted extensive thermo-chemical investigations and modelling to assess fission product tellurium-induced clad attack in fast breeder reactors.
The work resulted in numerous journal publications.
As part of research at the Research Centre, Julich worked on the vaporisation and thermodynamic behaviour of silicate glasses and Ni-Aluminium-based ternary alloys.
Work on silicate glasses led to the identification of the problems faced by the German industry.

b) **Thermogravimetry-based Transpiration Studies:** Established a new experimental programme for measuring equilibrium vapour pressures using the transpiration method based on Thermogravimetry.
Contribution to establishing a new method for thermodynamic measurements.

c) **Thermal Ionisation Mass Spectrometry:** Standardising methods for the analysis of nuclear fuel solutions irradiated in a nuclear reactor to determine burn-up (a measure of how much energy has been extracted from a nuclear fuel in a nuclear reactor), nuclear material input accountability and fission gas analysis of fast reactor fuels.
The measurements are crucial for the nuclear industry.

d) **Thermodynamic and Mass Spectrometric Studies on Fullerenes:**
Carried out work on Fullerenes. The work involved the ionisation and fragmentation behaviour of fullerenes. Partial pressures of fullerenes and the electron-impact ionisation cross sections of the Buckminsterfullerene (C_{60}) and C_{70} molecules were reported for the first time.
This work is of fundamental importance and paved the way for a better understanding of fullerene behaviour.

e) **Modelling of Fuel Behaviour:**
Formulated a new computational model to predict the carbon-to-metal ratio (C/M) as a function of burn-up, applicable to mixed carbide fuels with high plutonium content.
This work was crucial in increasing the burn-up of the Fast Breeder Test Reactor (FBTR) fuel at IGCAR, Kalpakkam. Four confidential reports are presented in this work.

f) Formulated a new computational model crucial to obtaining safety clearances for taking the high plutonium fuel of the Fast Breeder Test Reactor to higher burn-ups.

g) Member secretary of the Taskforce on "Fuel Specifications" for Fast Breeder Test Reactor (FBTR) and Prototype Fast Breeder Reactor (PFBR).

Research at Research Centre Julich, Germany

Thermodynamic Studies on Glasses and Alloys: As part of research at the Research Centre, Julich, worked on the vaporisation and thermodynamic behaviour of silicate glasses and Ni-Aluminium-based ternary alloys.
The work on Ni-Al-based alloys contributed to the development of alloys for industrial applications.
Work on silicate glasses led to the identification of the problems faced by the German industry.

Research at Texas A&M University, College Station, Texas, USA

High-Temperature Chemistry: Carried out high-temperature chemistry research to determine the thermodynamic stability of the molecules in the vapour phase. Some molecules studied include B_2N, Germanium clusters, and Germanium Carbide clusters.

This work is of fundamental interest. The molecule B_2N was detected for the first time, and its stability was assessed.

Research and Development work in the domain of Information Science:
Efforts focused on providing easy access to Scientific Information Resources, catering to the varied needs of researchers and a large student community. Applied innovative, advanced information technology principles to continuously enhance access to information resources at IGCAR. Taken the lead in creating infrastructure for digital content creation and converting print to digital. One of the crucial digital initiatives is the creation of "Subject-specific gateways", which make access to Information on a particular topic easy for patrons by bringing all relevant Information in one place.

Access to Information in the digital era is a challenge all information resource centres encounter, and the work reflects the progress made.