Extraordinary Achievements (Part-1): Activities in Detail

(Period: 01 April 2023 to 31 March 2024)

CENTRES OF INTER-DISCIPLINARY, TRANS-DISCIPLINARY STUDY AND RESEARCH AT THE VARIOUS SCHOOL OF THE UNIVERSITY OFFERING ACADEMIC PROGRAMMES SPREAD ACROSS THE FOUR CAMPUSES

The following Interdisciplinary and Transdisciplinary Centres for study and research at the various Schools of the University offering academic programmes spread across the four campuses have been started (March 2023), as part of the the Research & Development Cell set up in tune with the National Education Policy (NEP) 2020:

Sl No	Name of the Centre	Schools/Depts involved	Principal Coordinator(s)
1	Centre for Artificial Intelligence of Things (AIoT) and Mixed Reality (MR)	<u>Across all the following Schools</u>: Mathematical Sciences, Indian Heritage, Agriculture and Rural Development, Rehabilitation and Sports Sciences, Biological Sciences, Environment and Disaster Management	Swami Paramashivananda, Computer Software Architect and Technical Lead, Ramakrishna Math Media Lab, Chennai & Adjunct Faculty, Centre for AIoT & MR, RKMVERI, in collaboration with the Advisory Board comprising the following experts: ● Prof V. Kamakoti, Director, IIT Madras ● Prof Dilip Pratihar, IIT Kharagpur ● Dr Babu Sena Paul, Director, Institute for Intelligent Systems, University of Johannesburg, Gauteng, South Africa
2	Centre for 'Number Theory, Dynamical Systems and Chaos'	Departments of Mathematics and Physics	(i) Prof. Stephan Baier, Professor of Mathematics, School of Mathematical Sciences, RKMVERI (ii) Prof. Sukumar Adhikari, Dean, School of Mathematical Sciences
3	Centre for 'One Health'	Schools of: Biological Sciences, Agriculture and Rural Development, Environment and Disaster Management	(i) Swami Atmapriyananda, Pro-Chancellor & Secretary, RKMVERI (ii) Dr H. Sudarshan, Founder & Secretary, Karuna Trust, Bengaluru
4	Centre for	Schools of:	(i)Dr PG Dhar Chakrabarti, 'Swami

	'Humanitarian Studies and Humanistic Sciences'	Indian Heritage, Agriculture and Rural Development, Environment and Disaster Management	Vivekananda Professor' & Head, Environment and Disaster Management, RKMVERI (ii) Dr Paromita Roy, 'Swami Abhedananda Chair', Dept. of Sanskrit and Philosophy, RKMVERI
5	Centre for Consciousness Studies (CHATAK— Chaitanya Tattwa Anusandhan Kendra)	Schools of: Indian Heritage, Biological Sciences	(i) Brahmachari Mrinmay, Programme Coordinator, Dept. of Sports Science and Yoga, RKMVERI & Asst. Professor, Dept. of Computer Science (including Data Science) (ii) Dr Arkadeb Dutta, Asst. Professor, Dept. of Sports Science and Yoga, RKMVERI (iii) Swami Paramashivananda, Computer Software Architect and Technical Lead, Ramakrishna Math Media Lab, Chennai & Adjunct Faculty, Centre for AIoT & MR, RKMVERI
6	Centre for Study and Research on Veda-vedanta, Yoga (VYASA— Veda-vedanta Adhyayana-Samshodhana-Alaya)	School of Indian Heritage	Swami Japasiddhananda, Head of the Dept. of Sanskrit and Philosophy, RKMVERI

Activities of the Interdisciplinary and Transdisciplinary Centres during 2023-24:

1) Centre for Artificial Intelligence of Things (AIoT) and Mixed Reality (MR)

Objectives

The objective of the Center for AIoT & MR at RMVERI is to adopt multidisciplinary applied research, address distinct challenges and enhance working solutions across multiple fields and departments within RKMVERI (Ramakrishna Vivekananda Educational Research Institute) and RKMM (Ramakrishna Math & Mission) by leveraging four technologies: AIoT (Artificial Intelligence, Internet of Things) and MR (Mixed Reality = AR Augmented Reality + VR Virtual Reality)

Ongoing & Completed Projects for 2023/2024:

   a) **3D scanning of heritage artifacts/buildings associated with Swami Vivekananda and disseminating his message through digital storytelling   using Mixed Reality** (DST Grant – Rs.93 Lakhs)

   i. The objective is to create a detailed digital repository containing high-quality 3D models and images of heritage buildings and archival materials associated with Vivekananda's life and teachings. Once the repository is created, the plan is to create engaging online virtual tours to explore Vivekananda's legacy through our existing ePublications platform (http://publications.rkmm.org) and immersive experiences at our "Experience Vivekananda" museums

   ii. Scan heritage artifacts associated with Vivekananda using 3D (AI based) Laser/Imaging scanners that will also capture the texture of the object

   iii. 3D Reality capture of Heritage indoor spaces (Birth place of Swami Vivekananda) using photogrammetry

   iv. 3D Reality capture of Heritage outdoor spaces (Buildings like Vivekananda House at Chennai where he stayed for 9 days) using videogrammetry

   v. Do Post processing of captured data and export to standard 3D formats

   vi. Associate metadata with each captured artifact/space including geo-locations

   vii. Upload the data on cloud platforms with 3D VR viewer for online viewing

   viii. Add digital media content to compile a story for an immersive experience at RKMVERI

   ix. Enhance accessibility and appreciation of Swami Vivekananda's heritage utilizing digital storytelling of 3D scanned objects and spaces through virtual reality (and augmented reality in the future)

   x. Conduct excursions and trips for school and college students to "Experience Vivekananda" centers at our museums raising awareness and enabling a deeper understanding of Swami Vivekananda's life and teachings

xi. Our 3D Scanning proposal has been selected by DST on October 18th, 2023 and it has been recommended for funding of Rs.93 Lakhs. Grant is yet to be released as of April 2024.

xii. Another Govt of India project is in the offing with respect to immersive Experience that could be taken in 2024-25.

b) LLingaM – A Generative AI Platform for digital publications of Ramakrishna Math and Mission – RKMM LLM (Large Language Model) + GNAI (Generative AI)

Implemented a Generative AI Question Answer Platform for digital publiations of books on Life of Swami Vivekananda using Azure OpenAI with RAG (Retrieval Augmented Generation).

c) MEDHAWARRIORS – A Proposal for Assistive care for Dementia patients

MEDHAWARRIORS is an AT (Assistive Technology) based Core Services/Apps utilizing mainstream MR (Mixed Reality - AR/VR based viewable) devices & AI in conjunction with hearable and wearable to assist the PWD (Persons with Dementia) in improving the quality of their daily lives and benefiting the care partners.

MEDHAWARRIORS implement two core services:

(i) AIRRR (Person/Plants/Pets/Property) - Interaction based Recognition,

Rumination & Response using AI and AR (Augmented Reality)

Utilizing AI-based microservices, AR glass will do face recognition of acquaintances in a meet-up (physically/virtually) and retrieve the recent interactions with a summarization (text/video summary) and display virtual flashcards on the glass. If the PWD is not able to remember the acquaintance, the name, relation & location could be displayed on-demand. If the PWD intends to interact with the acquaintance, a short response would be drafted by advanced conversational AI-based systems to assist/prompt in initiating a conversation. Could be extended to Plants/Pets/Property with modified scenarios.

(ii) ARRV (Community) – Remote Assistance using AR (Augmented Reality) & VR (Virtual Reality)

ARRV is an AR/VR based system where a PWD wearing a AR/VR glass is able to get help in real-world LIVE from VCPWD (Volunteers/Care-Partners/PWD) community by superimposition of digital information on the real-world objects.

d) Digital Twin with Spatial Computing using AI, IoT and Mixed Reality Intervention for APPAN (Āpadā-Prabandh-Paryāvaran-Anusandhān-Niketan) Disaster Management and Environment Research Centre

The objective of the proposed APPAN shall be primarily to assist the Government of West Bengal in providing research support for disaster risk management in the State. A Digital twin technology is a virtual representation of real-world object, part or system with data flow between a real object and a digital object. In recent years, with modern adaptations, these are now extended to other fields such as human health, climate change by modelling an equivalent digital twin. AI Algorithms are used to analyze incoming data, update the digital twin in real-time, and provide predictive analytics about potential future changes in the ecosystem. Different climate scenarios can be simulated in the digital twin to understand how they would affect the ecosystem, enabling proactive planning. Transform collection of difficult to understand tables, charts, graphs, maps, images, and models into a 1:1 scale digital twin with a unified 3D experience of your project site or facility that becomes the single common operating picture for everyone ensuring the whole team can collaborate more effectively. Using spatial data platform, data interpretation and analysis become more intuitive, collaborative, and accessible in a fully immersive, easy-to-construct, and manage, 3D digital twin of your environment asset. Allows subject matter experts and non-technical personnel to work from a shared, easy-to-understand application enabling everyone to contribute to a unified dataset. Eliminate travel to project sites, reduce health and safety hazards and accelerate time to productivity for new employees by training them in Virtual Reality before sending them into the field. Once deployed, improve operations productivity and site-to-office communications by remotely monitoring IoT sensor data and visualizing status updates in real-time.

e) Visualization and Geomapping of Swami Vivekānanda's travel across the world

(i) Geomapping of Swami Vivekananda's travel across the world using Google Earth

(ii) Visualization of Swami Vivekananda's travel using yfiles enterprise diagramming tool

f) CODAI: An AI based Comparative Tool for promoting unbiased Diversity and Inclusion in College Admissions

CODAI is an AI-based comparative tool for College Admissions on CODA platform. It serves as a template for colleges to compare the admission criteria balancing between merit-based scores (such as GPA and Entrance exam scores) against socio-economic disadvantage indicators. This allows college admission offices to enhance their approach to improve diversity and inclusion especially in US Universities.

g) Guided MS (Big Data) Students from CS Department for their following term projects

   i. Creation of Knowledge Graph from input passage, Visualization, Integration with LLM

   ii. Finetuning LLMs for Human Alignment

   iii. Elevating User Device Interaction Using Hand Gesture Recognition

2) Centre for 'Number Theory, Dynamical Systems and Chaos'

Professor Sukumar Adhikari, Dean, School of Mathematical Sciences visited the Department of Mathematics, Princeton University, New Jersey, the State University of New Jersey, Rutgers and the CUNY Graduate Center, New York.

In Rutgers, he gave a talk on 'The polynomial method in the study of zero- sum theorems'. He visited Harish-Chandra Research Institute, Prayagraj from 4th Feb, 2024 to 17th Feb, 2024 for attending the workshop "Words and Transcendence - II";

Prof. Adhikari had been one of the organizers and speakers of the the workshop "Words and Transcendence" in KSOM from 7th to 12th August, 2023.

He also gave a plenary lecture in the International Seminar on Topology, Algebra and Applications (ISTAA-2024) during March 12-14, 2024, at North Bengal University.

Prof. Adhikari also organizes many seminars for teachers and students. For instance, he was one of the coordinators of the 'Instructional School for Teachers on Algebra and Number Theory' (funded by NCM, Mumbai) held at the North-Eastern Hill University, Shillong during June 26 to July 8, 2023. Recently Dr. Ibrahim Molla successfully defended his Ph. D. thesis (written under the supervision of Prof. Adhikari).

Professor Baier, Professor, Department of Mathematics, was a speaker at the following conferences/workshops: "Words and Transcendence" at KSOM from 7th to 12th August 2023, "Two Day National Workshop on ALGEBRA AND NUMBER THEORY" at SRTM University Nanded from 9th to 10th October 2023, "Discussion Meeting on Analytic Number Theory 2024" at ISI Kolkata from 8th to 12th January 2024, "Workshop on Analytic and Combinatorial Number Theory" at HRI Prayagraj from 20th to 30th March 2024.

The two last-mentioned conferences were attended by our post-doctoral fellow Nilanjan Bag and our PhD students Arkaprava Bhandari, Aishik Chattopadhyay, Sourav Das and

Anup Haldar. Two more members of our group spoke at the said "Discussion Meeting on Analytic Number Theory 2024":

Our postdoctoral fellow Dr. Nilanjan Bag and our PhD student Sourav Das. Esrafil Molla, PhD student under the guidance of Professor Baier, defended his PhD thesis successfully on 2nd April 2024.

This centre held seminars on a regular basis, covering the Riemann-Roch theorem last year and starting to look into the Oppenheim conjecture this year. Speakers were our PhD student Arkaprava Bhandari, our postdoctoral fellow Dr. Nilanjan Bag and Professor Baier. In connection with the Oppenheim conjecture, Professor Alok Kumar (Sikkim University) kindly provided a lecture series on ergodic theory to us (online). The seminars on the Oppenheim conjecture are ongoing with the goal to cover Margulis's ergodic theoretic proof of this conjecture. The long-term goal is to incorporate dynamical methods into our number theoretical research. This centre has also produced many papers on combinatorial and analytic number theory.

3) Centre for 'One Health':

Ramakrishna Mission Vivekananda Educational and Research Institute (RKMVERI), a deemed to be University declared by the Government of India under the University Grants Commission (UGC) Act, 1956, in the hallowed names of Sri Ramakrishna and Swami Vivekananda has taken the initiative to set up a 'Centre for One Health' which is being widely discussed in the recent times, particularly post-Covid 19 global pandemic. The World Health Organization (WHO) of UNO and ICMR (Indian Council of Medical Research) of Government of India, are seriously seized of this issue of 'One Health' which is an integrated approach to health comprising Soil-Plant-Animal-Human (SPAH) health issues in a holistic manner. The intention is to promote unified, integral, soil-plant-animal-human health. RKMVERI has set up a 'Centre for One Health' whose detailed roadmap and the work done so far during the period Dec 2022—Dec 2023 is delineated below.

1. **The 'One Health' Initiative proposed to be undertaken by RKMVERI**

RKMVERI's vision is a harmonious combination of the ancient Bharatiya Jnana Parampara (Indian Knowledge Systems Tradition) with the modern scientific knowledge as envisioned by Swami Vivekananda who gave us the following mandate: "Rooted in the Prachin Bharatiya Jnana Parampara (Ancient Indian Knowledge Traditon) and blending it harmoniously with the modern scientific knowledge, we should establish a University at Belur Math [under Ramakrishna Mission]". The 'One Health' initiative is one such integrated approach (rooted in the elaborate discussions and directives as found in Kautilya magnus opus, Arthashastra) blended with the modern soil-plant-animal-human health sciences.

This 'Centre for One Health' is thus an inter-disciplinary Centre with three basic components: (i) research, (ii) teaching, (iii extension/outreach/training programmes in 'One Health'. We envisage the creation of a large dedicated pool of 'One Health' workers well trained in the theretical and practical aspects of this emerging subject to promote unified,

integral, healthy soil-plant-animal-human-society nexus.

The 'One Health' concept is grounded on the assumption that the health of animals, people, plants, and the environment is interconnected and implies their integrated management to tackle health threats and promote holistic health of the entire environment with all its various components. [See the write-up enclosed herewith titled "The 'One Health' Concept—Its roots in the ancient Indian Wisdom"].

With substantial experience and expertise in agricultural sciences and rural development, the vibrant Departments of 'Agriculture and Integrated Rural and Tribal Development and Management' at the Narendrapur and Ranchi 'Off-Campus' Centres of RKMVERI deemed to be University together with the two Krishi Vigyan Kendras (KVKs) under the University hopes to achieve this projected goal. The 'Medical Biotechnology Division' at the Narendrapur 'Off-Campus' of the University will provided great support in this new venture. In line with the Food and Agricultural Organization of the United Nations' approach (https://www.fao.org/one-health/en/), the 'One Health' Initiative at RKMVERI may work on food security, sustainable agriculture, food safety, antimicrobial resistance, nutrition, plant, animal and human health, fisheries, and livelihoods. Such a transdisciplinary approach covering multiple sectors will need to generate critical knowledge on inter-sectoral interfaces (e.g., animal health and human health). The proposed 'One Health' Initiative will generate such knowledge, employ them to design multi-sectoral agri-food-health systems that work on the ground, and field test those solutions for contextual refinement.

The generated knowledge, systems design, and experience of community-level interventions will form the basis of developing teaching-learning resources and best practices, which will be used for university teaching, policy advocacy, and public outreach. Experts from diverse academic and professional backgrounds met at Belur Math on 5 December 2021 (members of the task force is provided in the list below) to discuss the possibility of initiating 'One Health' at RKMVERI.

A 20-member Task Force (see the list attached) was formed, with 5 more coopeted latern, drawing experts from the various fields related to 'one health' to work out the detailed roadmap in this regard. Some of the active collaborators in this initiative, to mentioned a few are: African Plant Nutrition Institute represented by Dr. Kaushik Majumdar, the Director-General of this Institute (https://www.apni.net/team/kaushik-majumdar/), and Girijana Kalyana Kendra & Karuna Trust, represented by Dr. H. Sudarshan, Secretary, Vivekananda Girijana Kalyan Kendra (https://en.wikipedia.org/wiki/Hanumappa_Sudarshan).

2. **'One Health' Initiative under the auspices of Ramakrishna Mission Vivekananda Educational and Research Institute (RKMVERI) in collaboration with Vivekananda Girijana Kalyan Kendra (VGKK)**

TASK FORCE (formed at a meeting held on 5 December 2021 at the Belur Main Campus of RKMVERI)

1.	Swami Atmapriyananda (Chairman)	Physics (Administrative Facilitator)
2.	Swami Shivapurnananda	Agricultural Biotechnology
3.	Dr. S. Ayyappan	Agricultural Sciences
4.	Dr. Prabodh Dhar Chakraborty	Disaster Management
5.	Dr. Kaushik Majumdar	Soil Science
6.	Dr. Sudarshan Dutta	Soil Science
7.	Dr. H. Sudarshan	Medical Sciences
8.	Dr. Gour Das	Medical Sciences
9.	Dr. P. K. Nag	Occupational Health
10.	Dr. Rupak Goswami	Rural Development
11.	Dr. Gautam Chatterjee	Agricultural Biotechnology
12.	Dr. Chandan Ghosh	Disaster Management
13.	Dr. Debasis Banerjee	Medical Sciences
14.	Dr. Kajal Sengupta	Agronomy
15.	Dr. Abhijit Chakrabarti	Biochemistry
16.	Dr. N. C. Sahu	Soil Science
17.	Dr. Ashwin Laxmikant Kotnis	Biochemistry
18.	Dr. Sarbaswarup Ghosh	Veterinary Sciences
19.	Dr. Swagat Ghosh	Fisheries Science

20.	Dr. Krishnendu Ray	Agronomy
21.	Dr. Paromita Roy	Philosophy (Environmental Ethics)
22.	Dr. K. Aguan	Molecular/Cell Biology, Neuro-genetics
23.	Dr Nachiketa Chattopadhyay	Econometrics, Statistics
24.	Dr Debasis Sengupta	Statistics
25.	Sreeraj Roy	Pharmaceuticals (Strategy & Business)

3. **Write-up on 'One Health' Health—its roots in the Ancient Indian Wisdom**

3.1. How did the concept of 'One Health' originate?

'One Health' is in fact a collaborative, multi-disciplinary approach aiming at optimal health outcomes by recognizing the interconnection between plants, animals as well as humans and their shared environment. The term 'One Health' was first used in 2003-2004 and was associated with the emergence of severe respiratory disease (SARS) in early 2003 followed by the spread of highly pathogenic avian influenza H5N1 which led to evolving of strategies specifically known as 'Manhattan Principles' listing 12 recommendations in Wild Life Conservation Society (WCS) meeting held in Sept 2004 to trace the roots of epidemic diseases and thereby fight the crisis with an understanding of ecological integrity which speaks of a holistic approach toward environment.

Interestingly, but not surprisingly, the idea of 'One Health' that is fast gaining acceptance in the modern idea of 'integral health' or 'convergence' as it used to be called, has its roots in the ancient Indian thought. 'Oneness' has been the key concept cultivated and emphasized in the ancient Indian wisdom of the Vedas and the Vedanta—in the Upanishads we find repeated references to *ekatva vijnana*, (the Knowledge of Oneness). Although appearing anew on global platform reincarnating as it were in a new form, this idea of 'Oneness' is the bedrock upon which the ancient Indian edifice of philosophical, spiritual and scientific thought was based. It is wonderful to see how the Indian thought current has been silently transforming the thought current of the world. In Swami Vivekananda's inimitable poetic words: "Like the gentle dew that falls unseen and unheard, and yet brings into blossom the fairest of roses, has been the contribution of India to the thought of the world. Silent, unperceived, yet omnipotent in its effect, it has revolutionized the thought of the world."

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India has always nurtured in her bosom the ideas of 'unification', 'integration', 'harmony and synthesis' leading to One Unified State of Existence, wherein the scientific, philosophical and spiritual ideas of 'interconnectedness' and 'interdependence' lead in practice to collective and universal wellbeing, because the wellbeing of the individual is intimately related to the wellbeing of the collective—one is all: the microcosm-macrocosm is one Indivisible Whole.

3.2. One World, One Health in the Vedas

The idea of nature deification in the Vedic age reveals how men realized the interconnection with each component of nature. Through the process of deifying nature,

Vedic men expressed gratitude toward the nature in its entirety which maintains their survival. Men therefore considered themselves only as part of the entire causal nexus of events which is characterized by symmetry. Each of the parts has its roots in the Greater

Whole from which they originate and such is true of all events and phenomena which Vedic Rishis deified 'ekaṁ sadviprā bahudhā vadanti…' (Rg Veda 1.164.46) or 'ekaṁ santaṁ bahudhā kalpayanti…' (Rg Veda 10.114.5): "That which exists is One, the sages call it differently", "That being One, is imagined to be many".

3.3 One World--One Health in the Upaniṣads

The Upaniṣads explain how One World has originated from the Supreme Reality. To quote a verse from the Taittirīya Upaniṣad:

> tasmādvā etasmādātman ākāśaḥ saṁbhūtaḥ /
>
> ākāśādvāyuḥ / vāyoragniḥ / agnerāpaḥ /
>
> adbhyaḥ pṛthivī /
>
> pṛthivyā oṣadhayaḥ /
>
> oṣadhībhyo'nnam /
>
> annātpurūṣaḥ / (Tai UpII.i.1)
>
> From that Brahman indeed, which is this Self, was produced space.
>
> From Space emerged air. From air was born fire. From fire was created
>
> water. From water sprang up earth. From earth were born the herbs.
>
> From the herbs was produced food. From food was born man.[1]

The world with all its elements (living and non-living) having their locus in the Supreme Being advocate a wonderful accord that runs through them. Any harm done to any of the

elements would eventually inflict harm on the other as all are interrelated in this Cosmic Whole.

3.4. One World--One Health in Arthaśāstra, Manusaṁhitā and Yājñavalkyasaṁhitā

Though being a book on the science of polity, Arthaśāstra did not overlook nature's well-being. It was believed that economic gains can be ensured only when all aspects of nature are well taken care of. The king had the moral obligation to protect the bounty of nature.

We notice not only strict vigilance of the Superintendent of Agriculture for optimal land usage, homage to land for better productivity and human sustenance is also visible in the Arthaśāstra. Thus goes the following verse:

> prajāpataye kāśyapāya devāya ca namaḥ sadā /
>
> sītā me ṛdhyatāṁ devī bījeṣu ca dhaneṣu ca // [2]

Every time crops were sown in any particular time of year, a handful of seeds soaked in a pot of water with a piece of gold had to be sown chanting the above mantra whereby homage is paid to God Prajapati, Kaśyapa (son of Sūrya). It is prayed so that agriculture may prosper and the Goddess (Sītā Devī) may bestow her blessings.

Apart from land care, Arthaśāstra also mentions the presence of the Superintendent of Forest, Superintendent of Domestic Animals ensuring the well-being of the biotic community. Arthaśāstra also lays down extensive measures for wasteland management.

The statecraft in Arthaśāstra clearly reveals that everything in nature is intertwined and therefore to ensure economic gains the king had to look into every sector of nature.

The idea of Pañcamahāyajña in the Manusaṁhitā projects the moral responsibility of an individual to protect nature. He realizes that he is nurtured by nature and therefore in the

Gārhasthya stage of life an individual is found to execute his moral duties towards the entire world. Thus goes the verse:

> adhyāpanaṁ brahmayajñaḥ pitṛyajñastu tarpanam /
>
> homo daivo balirbhauto nṛyajñohatithipūjanam // [3]

Teaching and studying is the sacrifice offered to the Brahmanas. The Pitṛ Rṇa is the obligation that the moral agent owes to his ancestors so that human race may survive and grow. This he discharges by paying respect to the ancestors by performing funeral rites and other ceremonies. The Deva Rṇa is the obligation that the householder owes to the entire universe. This he discharges by pouring oblations in the fire. The Bhuta Rṇa is the obligation that the moral agent owes to the lower animals. This he discharges by giving food and protecting them. The householder is also indebted to his neighbours and other beings which is the Nṛ Rṇa. This he discharges by serving and entertaining guests. The idea behind Pañcamahāyajña is One World--One Family where the well-being of one is intertwined with the well-being of the other. The Yājñavalkyasaṁhitā also projects individual commitment towards the entire world in the following verse:

balikarmasvadhāhomasvādhyāyātithisatkriyāḥ /

bhūtapitramarabrahmanuṣyāṇāṁ mahāyajñāḥ // (1/102)

Sacrifice of animals (Bali), oblation or food offered to the manes (Svadhā), oblation
of Fire (Homa), study and teaching of the Vedas (Svādhyāya), and the reception
of guests, are the greatsacrifices of the Bhūtas (evil spirits), Pitr-s (departed manes),
Devas (celestials), Brahmā, and Manuṣya (mankind).

The discharge of duties by an individual householder is indeed a way to honor the entire creation of which he is a part. This significantly undermines the prospect of any sort of human dominion and lordship over nature. Man discharges his responsibilities as a citizen of this world. This creates a strong sense of bonding between man and nature that eventually paves the way to the development of an eco-community.

3.5. How is the idea of eco-community significant to ensure 'One Health'?

The ancient Indian perspective towards nature is extremely necessary to ensure well-being of the entire community of nature. It is not divided state of existence but living in harmony with nature that can help in developing better health infrastructure where the life of one is not sacrificed for the enjoyment and benefit of humans. It is the intrinsic value of nature and not its instrumental value that is needed to be realized by in this hour of crisis.

Aldo Leopold (1887-1948), the most influential figure in the development of an eco-centric environmental ethics in an essay in 'A Sand County Almanac' says "Land then is not merely soil; it is a fountain of energy flowing through a circuit of soils, plants, and animals." He writes further "the land ethic simply enlarges the boundaries of the community to include soils, waters, plants, and animals, or collectively the land." He uses the idea of a "biotic pyramid" or "land pyramid" to help us understand the nature of biotic community. The concept of eco-centric ethics is taken further by the Norwegian philosopher, Arne Naess in his concept of an 'Ecological Self'. The concept of Deep Ecological sense of the Self requires a greater maturity on the part of a human whereby he

can identify himself with the non-human realm of nature. Such an understanding helps and individual to transcend the concept of any isolated ego that insists on the development of a person as a separate individual. This is exactly what our Indian tradition has silently upheld millennia upon millennia.

In the modern age, Swami Vivekananda, following his Master, Sri Ramakrishna, revived at the philosophical, scientific and spiritual levels, the ideas of the ancient system of Vedanta:

(1) Innate, inherent Divinity of every individual being,

(2) Oneness or Unity of All Existence (Solidarity of the Universe) through the discovery of Microcosm-Macrocosm Identity,

(3) Thus leading to Divinity of All Existence.

Romain Rolland therefore rightly said: "In the two words, equilibrium and synthesis, Vivekananda's constructive genius may be summed up. …He was the embodiment of the harmony of all human energy."

A fitting finale to this short write-up is the following Shanti Mantra (Peace Chant) that invokes in telling language peace and benediction, and therefore joy and happiness (for there can be no joy without peace as the Bhagavad-Gita says: "Ashantasya kutah sukham"—Gita, 2.66) on the entire gamut of existence: the sky, interstellar space, the earth, the waters (rivers and oceans), the plants and the herbs, trees and the environment, all the forces of Nature, in fine, ALL of creation—may supreme peace pervade, envelop and interpenetrate the entire universe.

द्यौः शान्तिरन्तरिक्षं शान्तिः पृथिवी शान्तीरापः शान्तिरोषधयः शान्तिः।

वनस्पतयः शान्तिर्विश्व देवाः शान्तिर्ब्रह्म शान्तिः सर्वं शान्तिः शान्तिरेव शान्तिः सा मा शन्तिरेधि॥

(शुक्ल यजुर्वेद ३६-१७)

> *Om. Dyouh shantih, antariksham shantih, prithvi shantih, aapah shantih, oshadhayah shantih, vanaspatayah shantih, vishve devaah shantih, brahma shantih, sarvam shantih, shantireva shantih, saa maa shantiredhi. Om shantih, shantih, shantih.*

English Translation of the above Mantra:

Om. May peace prevail in the heavens (the sky). May peace prevail in the interstellar

space. May peace reign on the earth. May the waters be peaceful. May peace be on all the plants and herbs. May peace reign on all the trees and environment. May peace rest with all the divine beings. May the Supreme Being and the scripture be the Abode of Supreme Peace. May peace reign everywhere and in every being. May there be peace and more peace everywhere at all times. May that supreme peace come to me too [by the grace of the Supreme]. Om peace, peace, peace!

References:

1. Swāmī Gambhīrānanda (translated) Eight Upanisads (Volume one), Advaita Ashrama 2006, pp-304

2. Bandopadhyay Manabendu: "Kauṭilyam Arthaśāstram" (edited and translated)Bengali, Sanskrit Pustak Bhandar,1st vol & 2nd vol 2002 & 2001 respectively, verse 2.24.10.

3. Bandopadhyaya Sureshchandra (translated) Bengali, "Manusamhita", Ananda Publishers Pvt. Ltd.1999, verse 3.70.

4. K.L Joshi (Edited and revised), Manmatha Nath Dutta (translated), Yajnavalkyasmrti, Sanskrit Text, (English Translation, Notes, Introduction and Index verses), Parimal Publications, 2005, pp-26-27, verse-102

4. Education & Training Programs: Certificate Course on 'One Health'

IRDM401: Introduction to 'One Health' (2 credits)

Course Objectives:

The objective of this introductory course is to appreciate &explore how humans, plants, animals, and the environment are all inter-connectedthrough the lens ofthe concept of One Health. The course shall make the students across the disciplines, aware of the concept by combining traditionalwisdomwith modern sciences.

Syllabus: (32 lecture hours)

Module 1: Philosophical & Cultural aspects of One Health (2 Lectures)   Dr.Paromita Roy

A philosophical,spiritual and aesthetic view, emergence of One Health concept, interdependence of Human, Plant, Animal, and Environmental health – An overview

Module 2: Planetary Health (4 L)   Dr. Prabodh Dhar Chakrabarti

Climate change, deforestation, lossof biodiversity, ocean acidification, phosphorus and nitrogen cycle, their impacts on human, animal and plant health

Module 3: Environmental Health (4 L)   Dr. Chandan Ghosh

One Environment – air, water, and soil, air health –pollution, ozone depletion, carbon cycle, fossil burning, and GHG emission; Water Health – supply source, sanitation, contamination,transmission of waterborne infections and diseases; Soil Health – micronutrients and biological properties, soil micro- and macro-fauna, pesticides contamination;implicationsonenvironmentalhealth, transmission of infections and disease

Module 4: Plant Health (4 L)   Dr. Kajol Sengupta

Evolutionary relationships across different forms of life, traditional and organic versus modern farming: impacts on soil, plant, animal, and human health; agricultural systems, agronomic practices, modern mechanization on plant health; plant-microbiome network; food sources and nutrition

1) Introduction [Importance of Plant Health in 'One Health - human and animal health are closely connected to plant health for at least following reasons:

   (i)   Food security, (ii) Food safety, (iii) Feed security and (iv) Livelihoods.

2) Traditional and organic versus conventional or modern farming- Merits of Organic farming.

3) Agronomic practices – Bad practices vs. Good practices; Importance of soil health; Sustainable crop management -   The nexus between plant and plant microbiome and its importance in plant health

4) Food sources, their quality and nutritional value.

Module 5: Animal Health (4 L)   Dr.Sarbaswarup Ghosh

Human-Animal relationship and welfare, Human-Wildlife coexistence, increasing incidents of conflicts, impact in the rural economy, conservation efforts; aquatic animal health (Disease monitoring, Surveillance, Epidemiology, Quarantine, Certification, Import risk analysis.), animal food sources and nutrition;Soil health →Animal feed → Animal health → Animal food quality; Strategic dietary supplements in animals and aquatics; Defining and understanding emerging zoonotic disease, antimicrobial and anti-helminthic resistance.

For Aquatic animal- Application Good Manufacturing Practice (GMP), Good Hygiene Practice (GHP), Hazard Analysis and Critical Control Point (HACCP)-programme, Probiotics and bioremedial measures; Immuno-stimulants and their role.

Module 6: Human Community Health (4 L)   Dr. H Sudarshan

Physical health – The foundation, Mental and behavioural health – benefits of human-plant, and human-animal interactions; Cultural health –the strength and protection; Communicable and non-communicable diseases; Antimicrobial resistance (AMR);Lessons learned from COVID-19 outbreaks; Emerging zoonotic disease threats.

Module 7: Eco Health (2 L)   Dr. Gautam Chatterjee & Colleagues

One Earth, One Ecosystem, One Health; Nutrient recycling and nutrient flow in the Ecosystem, Biodiversity and its role inecosystem health

Module 8: Management of Epidemics & Pandemics (2 L)   Dr.Prabodh Dhar Chakrabarti / Dr. Anindya Mukherjee

Extreme events and the resulting influences on One Health; Emerging threats, perspective, prediction and risk management

Module 9: Socio-economic aspects of One Health (4 L)   Dr.Rupak Goswami

Social and cultural aspects of human-animal interactions; Reflective and Participatory Social Science for One Health – Concepts and Reported Cases; One Health Economics – Concepts, Reported Evidences, Examples of Economic Analyses used in One Health; Linking One Health to Sustainable Livelihoods

Module 10: Emerging Policy & Institutional Framework (2 L)   Dr.   Prabodh   Dhar Chakrabarti

One Health in policy development, One Health in action and practice, Academic and Institutional One Health program; The nature of One Health study – concepts and examples from Zoonoses, antimicrobial resistance, surveillance systems, etc.; The concept of complex systems, defining systems and systems boundary, sampling, design considerations, analysis plans, and ethical considerations.

5. Booklet under preparation under the 'Centre for One Health'

'One Health' — the Philosophy and Practice from the perspectives of Ancient Indian Wisdom and Modern Global Trends of Thought by Dr Paromita Roy, Asst. Professor in Philosophy, Dept. of Sanskrit and Philosophy & 'Swami Abhedananda Chair', School of Indian Heritage

Ramakrishna Mission Vivekananda Educational and Research Institute (Deemed to be University declared by Govt. of India under UGC Act, 1956) P.O. Belur Math, Dist. Howrah, West Bengal

Contents of the above book

Preface

Chapter 1. How did the concept of 'One Health' originate?

Chapter 2. Instrumental value vis-à-vis Intrinsicvalue of environment—Conflicts in environmental policy making

Chapter 3. Why do we need philosophy?

Chapter 4. How Indian wisdom can be a savior to environmental damage

4.1. Holistic approach towards nature in the Vedic era:

4.1.1.Rg Veda and the Yajur Vedatraditions

4.1.2. Atharva Veda tradition

4.2. Holistic approach towards Nature in the Upaniṣads

4.3. Holistic approach towards Nature in the heterodox Indian (Jain and Buddhist) traditions:

4.3.1. The Jain tradition

4.3.2. The Buddhist tradition

4.4. Holistic approach towards Nature in the Arthaśāstra, Manusaṁhitā and

Yājñavalkyasaṁhitā:

4.4.1. Arthaśāstra

4.4.2. Manusaṁhitā

4.4.3 Yājñavalkyasaṁhitā

Chapter 5. Tribal Traditions and Culture: Holistic vision towards Nature among the indigenous people

Chapter 6.Whither next: Future Hope in Healing the Earth

Contents in detail for the above book have already been prepared, running to nearly 100 pages. Each of the topics will lead further elaboration and detailed referencing. This is under preparation and the whole book (running to about 250 pages), capturing both the ancient Bharatiya Wisdom tradition and the modern scientific knowledge about 'one health' is expected to be published within one year (2024-2025).

6. **Physical infrastructure for 'Centre for One Health'—three-storeyed building** at RKMVERI's Narendrapur 'Off-Campus' Centre's 'Sasya Shyamala' Krishi Vigyan Kendra (KVK) is almost already—some additions and finishing touches are pending and the work is getting delayed for want of funds. The entire building is expected to be ready and functional within a year (2024-2025).

4) Centre for 'Humanitarian Studies and Humanistic Sciences'

The humanitarian ideas, principles and practices of reaching out to the people in distress due to natural calamities, war, conflicts, civil disturbances or similar situations, for saving lives and alleviating the sufferings are age old. The Christian ideas of charity have been dominant in Europe and America and influenced humanitarian interventions around the world during the colonial and post-colonial period. The Hindu concept of Seva or service to humanity, the Islamic concept of Zakat or act of giving to the needy and the Buddhist idea of Karuna or compassion for the suffering have been the motivating spirits behind humanitarian action in India and other developing countries.

2. Ramakrishna Mission has contributed to these rich traditions through its seamless humanitarian services for over 125 years to people in distress in various parts of the country and outside. The spirit of selfless and devoted service with dignity without any discrimination fear or favour has added new dimensions and values to the existing standards and practices humanitarian services.

3. In order to draw lessons from the rich humanitarian philosophy of India in general and glorious humanitarian tradition of Ramakrishna Mission in particular it was decided to establish a special Centre for Humanitarian Studies and Humanistic Sciences as a multi-disciplinary research centre involving the School of Indian Heritage and School of Environment and Disaster Management. The following are the objectives of the Centre:

a) Carry out research on humanitarian philosophy of India and humanitarian tradition of Ramakrishna Mission to add values to the contemporary global discourses on humanitarian ethics;

b) Carry out research on humanitarian system of India;

c) Start a Certificate Course on humanitarian studies and action

4. Following activities have been taken up by the Centre during 2023-24:

A. Research on Humanitarian Philosophy of India:

A project proposal on Humanitarian Philosophy of India was submitted to the Indian Council of Philosophical Research (ICPR) jointly by the School of Indian Heritage and School of Environment and Disaster Management. ICPR has approved the proposal and sanctioned

financial grant of Rs. 6.00 lakhs for conducting the research over a period of two years. A copy of the project proposal is attached as annexure-I. Work on the project is going on.

B. Certificate Course on Humanitarian Studies and Action:

One year online certificate course on Humanitarian Studies and Action has been designed by the School of Environment and Disaster Management and the same has been approved by the Board of Studies. A copy of the course module is attached as Annexure-II. It has been decided to conduct the course in collaboration with some reputed national and international institutes. National Institute of Disaster Management (NIDM) New Delhi and International Federation of the Red Cross (Geneva) has been approached. Their response is awaited.

C. Research on Humanitarian System of India:

Based on his own knowledge and experience Dr P G Dhar Chakrabarti Swami Vivekananda Chair Professor and Head of School of Environment and Disaster Management has undertaken a study on Strengthening Humanitarian System of India. The study report is expected to be completed soon and submitted for publication. Meanwhile Dr Chakrabarti has made several presentations on the subject in various national and international conferences.

5) Centre for Consciousness Studies (CHATAK—Chaitanya Tattwa Anusandhan Kendra)

Seminars and Webinars:

1 Fifteen-day long webinar series on "Science of Pranayama" during 1 June -15 June 2023

The Department of Sports Science and Yoga School of Rehabilitation and Sports Sciences at Ramakrishna Mission Vivekananda Educational and Research Institute (RKMVERI Deemed University), Belur Math conducted a fifteen day webinar series on the topic **"Science of Pranayama" which** covered topics on classical scriptural basis of pranayama as well as modern scientific evidence on the health benefits of pranayama. This webinar series of **15 lectures** covered various aspects of pranayama in special reference to the scriptural basis of pranayama,as well as evidence based modern scientific basis of pranayam, both from the point of theory and practice, based on our ancient authentic scriptures as well as modern scientific (neuro-physiological and cardiological evidence). Speakers were drawn from a large pool of competent monks of Ramakrishna Order available at our University and those elsewhere in India and abroad, scientists (neuro, cardiological, physiological, psychological, etc.), and medical doctors.

Webinar Schedule: 1 -15 June 2023

Module 1: Scriptural basis of Pranayama			
Date	Title/Topic	Name of resource persons	Affiliation
1 June	Inauguration of the webinar	Swami Atmapriyananda	Pro Chancellor, RKMVERI
	Scientific basis of pranayama	B N Gangadhar	President, National Medical Commission
2 June	Fundamental concepts of classical pranayama	Dr O P Tiwari	Former Director, Kaivalyadhama
3 June	Swami Vivekananda's ideas on prana and pranayama	Swami Atmarupananda	Minister in charge, Centre Vedantique Ramakrishna, Gretz, France
4 June	*Prano virat*—'Life is immense' (Rabindranath Tagore)	Swami Atmapriyananda	Pro Chancellor, RKMVERI
5 June	Insights on Pranayama from Jytosna Commentary of Hathayogapradeepika	Dr. Jayaraman Mahadevan	Professor & Dean, Division of Yoga and Spirituality, SVYASA Yoga University, Bengaluru
6 June	Essentials of Pranayama	S Sridharan	Senior Trustee, KYM Chennai
8 June	Esoteric theory of prana and pranayama	Swami Vidyapradananda	Head, Department of Sports Science and Yoga, RKMVERI
13 June	Dimensions of Pranayama in Vedanta	Swami Japasiddhananda	Head, Department of Sanskrit & Philosophy,RKMVERI

Module II: Scientific basis of pranayama			
7 June	Effects of pranayama on Anxiety, Affect, and Brain Functional Connectivity	Draulio Barros de Araujo	Brain Institute, Federal University of Rio Grande do Norte (UFRN), Natal, Brazil
9 June	Cardiorespiratory and Endocrine Mechanisms Behind the Effectiveness of Pranayama	Dr Angarai Ganesan Ramakrishnan	Professor of Electrical Engineering ·and associate faculty of Centre for Neuroscience Indian Institute of Science Bengaluru
10 June	Effects of Pranayama on Brain Structure & Function	Dr Shubhadip Paul	Assistant Professor, Department of Sports Science and Yoga, RKMVERI
11 June	'Power of pranayama: The science of breathing'	Dr Indranil Basu Ray MD, DNB (Card), FACP, FACC	Chairman American Academy for Yoga and Meditation, Tennessee, USA
12 June	Yoga and Pranayama in Neurological Rehabilitation: Current Evidence	Dr. Anupam Gupta. MBBS, MD	Professor & Head, Department of Neurological Rehabilitation, NIMHANS Bangalore
14 June	Understanding Pranayama and its scientific mechanism of action	Dr Hemant Bhargava MBBS, MD (Yoga & Rehabilitation), MSc (Psychology), PhD	Assistant Professor, Department of Integrative Medicine, NIMHANS Bangalore
15 June	Valedictory session	Swami Sarvottamananda	Vice-Chancellor, RKMVERI

Webinar Webpage:

https://sy.rkmvu.ac.in/webinar-on-science-of-pranayama-1-15-june-2023/

Youtube channel of lectures

https://www.youtube.com/playlist?list=PLGMjoMW5fbf9ABGpokZAlhnG-wgLssT6U

Photos are available in https://drive.google.com/drive/folders/184ZqqtpejrYiI-em2lAgJOpwgfQQWk1J?usp=sharing

Registration : A total of 290 people registered in the webinar.

2 Half-day seminar on "Science of Suryanamaskar", 21 March 2024

Suryanamaskara was an integral part of daily obligatory routine (*nitya vidhi*) in Vedic times. The earliest form of Suryanamaskara is called the *Tṛcā kalpa mantra* and is found in the first maṇḍala of Ṛgveda (RV 1.50.11-13). These mantras also appear in *Hridrogkāmalānāśana sūktam* of Atharva Veda. A careful study reveals that through these mantras one prays to the Sun to rise up high and with its all conquering vigor remove two specific diseases - heart disease or *hṛdrogaṃ*, and bilious disease or *harimāṇaṃ (*in Atharva Veda, it is called *kāmalā*, a particular form of bilious disorder). These mantras indicate that one of the non-pharmacological methods of treatment by the Atharvan priest was the use of sun rays in treating specific diseases. There are other references in Atharva Veda regarding the germ killing power of sun rays and how sun dispels diseases and sickness. The Atharvan priest used various charms in the treatment according to the aetiological factors and origin of diseases. Charms are mantras infused with energy and were extensively used in healing. Ayurveda also uses divine intervention (*Daiva-vayapāśraya cikitsa*) as an established method of treatment to cure the unknown and unnoticed causes of diseases. Physical prostrations showing complete surrender to the Sun was also an important aspect of Sun salutation. In modern times Dynamic Suryanamaskara (DSN) is widely practised as cardio and fitness exercises. It has twelve postures involving stretching, supine, prone, back bending, and standing. In a sequence one moves from standing position down to sashtanga namaskara and then back to standing position. Each step is counterbalanced with the previous one, alternately contracting and relaxing the abdominal area, helping the lungs to breathe naturally and synchronously by alternating inhaling and exhaling. The linkage between a healthy heart and healthy bile was established later in Ayurvedic literature. According to Suśruta, heart disease is caused due to flow of impure blood in the heart, mainly for digestive issues and one of the five principal causes of heart disease is *pitta doṣa*. Modern scientific studies also establish the link between cardiac and gastrointestinal disorders and how the postures practiced in modern Suryanamaskar plays a bi-directional role in modulating the gut–brain axis and thereby help attenuate the problems associated with the heart and digestive system. Similarly studies have also found how blood pressure and cardiovascular diseases can be attenuated with regulated exposure to the sun. A seminar/workshop on **The Science of Suryanamaskara** aims to present the vedic roots of Suryanamaskara and how the sun rays were used in treatment of diseases. It will also highlight the results of modern scientific findings on the health benefits of Suryanamakara, with particular reference to the heart, brain and gut.

Schedule

Time	Event/Title of talk	Speaker/Instructor
5.00 pm-5.20 pm	Introductory Remarks	President/General Secretary of the Asiatic Society, Kolkata, &

		Pro-Chancellor of 'Vivekananda University', Belur Math
5.25-5.50 pm	Vedic roots of Suryanamskara: Tricha Kalpa Mantras of Rigveda Suryanamaskar as a vedic system of medicine of Atharvaveda	Swami Vidyapradananda
5.55 pm-6.30 pm	Modern Dynamic Suryanamaskara demonstration with mantras	Sanjoy Majhi and Debraj Das
6.35 pm-7.05 pm	Physiological and neurophysiological changes that happen to the brain and the heart during Suryanamaskara	Dr Arnab Das, Asst. Professor, Dept. of Sports Science & Yoga, Vivekananda (Deemed) University
7.05 pm-7.15 pm	Concluding remarks	Secretary, Ramakrishna Mission Institute of Culture, Gol Park, Kolkata

Venue: Ramakrishna Mission Institute of Culture, Gol Park, Kolkata (Vivekananda Hall)

A total of 300 plus people participated in the webinar. The YouTube link of the seminar is

https://youtu.be/T7ICnPiK_NY?si=0tirbXYjRFxQO21

Immersion Programs

1. One-day immersion program for students of IIT Kharagpur, 10 September 2023

On 10 September 2023 the Division of Indian Knowledge Systems (IKS) at the Indian Institute of Technology (IIT), Kharagpur, came for a one-day 'Immersion Programme' with about 100 students who are taking the course 'Gnostic Foundations of Yoga'. The immersion aimed at providing the students with a hands-on experience on the various paths of yoga, encompassing bhakti, jñāna, rāja, karma, and hatha yoga in their manifested forms. This immersive journey is aimed to enhance understanding through swādhyāya (self-study), observations, and engaging interactions with sādhaks (spiritual practitioners) and volunteers from the Ramakrishna Order at Belur Math and Ramakrishna Mission Vivekananda Educational And Research Institute (RKMVERI), Belur.

PROGRAMME on 10-September-2023

At Saradananda seminar hall (1.00pm - 2.30 pm)

1 1.00pm-1.05pm Welcoming the IIT team and introducing the monk-speakers -- Swami Vidyapradananda

2 1.05pm-1.25pm (Including 5 min Q&A) - Synthesis of Four Yogas- Swami Vivekananda's Vision , Swami Atmapriyananda, Pro-Chancellor RKMVERI

3 1.25pm - 1.50 pm (Including 5-10 min of Q&A) Science of Patanjali Yoga - Swami Sarvottamananda, Vice Chancellor, RKMVERI

4 1.50pm - 2.15 pm (Including 5-10 min of Q&A) : Yoga Techniques for Lifestyle Transformation - Swami Kaleshananda, Registrar, RKMVERI

5 2.15pm -2.30pm : Science of Pranayama - Swami Vidyapradananda, Dy Registrar, RKMVERI

6 At Brahmananda meditation hall (2.30pm-3.30 pm) Guided meditation by Swami Kaleshananda

7 3.45pm - 4.45pm – Yoga Practice at Yoga Hall

8 5.00 pm – group photo

2. One-day immersion program for students of IIT Kharagpur, 31 March 2024

As in the previous years, the Division of Indian Knowledge Systems (IKS) at the Indian Institute of Technology (IIT), Kharagpur,brought about 30 students for a one-day 'Immersion Programme' for the newly admitted students of the IIT in the holy precincts of Belur Math. Revered Swami Bhajananandaji Maharaj, Vice-President of Ramakrishna Math and Ramakrishna Mission, kindly inaugurated this programme with his words of benediction and inspiration.

PROGRAMME DETAILS

Date: 31 March 2024 (Sunday)

MORNING SESSION

Time: 8.45 — 10.00 AM

<u>Venue</u>: Saradananda Seminar Hall, Prajna Bhavan

(1) Invocation: Vedic Shanti mantras — Students of the Sanskrit Dept. (5 mins.)

(2) Welcome and Introductory Remarks: Swami Sarvottamananda, Vice Chancellor (10 mins.)

(3) About the 'Immersion Programme' introduced for the newly admitted students of the IITs and other technical institutes by the Govt. of India — its significance:

Prof Richa Chopra, Core Faculty, Centre of Excellence for Indian Knowledge Systems (IKS), IIT Kharagpur (10 mins)

(4) Knowledge-power attained by purity, concentration and meditation: Revered Swami Bhajananandaji Maharaj, Vice-President, Ramakrishna Math and Ramakrishna Mission, Belur Math, West Bengal (35 mins.)

(5) Interaction (Q & A): 15 mins.

AFTERNOON SESSION

Time: 2.00 — 4.00 PM

<u>Venue</u>: Saradananda Seminar Hall, Prajna Bhavan

1. Invocation: Vedic Shanti mantras — Students of the Sanskrit Dept. (10 mins.)

2. Scientific approach to the Indian Knowledge Systems in the modern age of science and technology: Brahmachari Bodhi Chaitanya (Dripta Maharaj), Asst. Professor, Dept. of Mathematics & Asst. Registrar, RKMVERI (20 mins.)

3. Study and Research in Yoga-Vedanta by the students of science and technology — why and how: Swami Vidyapradanandaji, Asst. Professor, Dept. of Computer Science and Data Science & Deputy Registrar, RKMVERI (20 mins.)

4. How scientific is the Paninian Sanskrit grammar — discussion in the common man's language: Swami Japasiddhanandaji, Head of the Dept. of Sanskrit and Philosophy, RKMVERI (15 mins)

5. Chairman's address: Three pillars of education for character-building — truthfulness, purity, selflessness — *sine qua non* of the modern educated youth: Swami Sarvottamanandaji, Vice Chancellor, RKMVERI (25 mins)

Photos of the event: https://drive.google.com/drive/folders/1YwaxGrM-teY3duDPdAQ_K0soesdiv6_B?usp=sharing

Research projects

The VIVEK-CHATAK center is currently pursuing following projects

Title of project	Investigators
Effect of Vedic Chanting on Brain Oscillatory Waves	Dr Arkadeb Dutta (PI), Assistant Professor, Department of Sports Science and Yoga, and Swami Japasiddhananda (coPI)

	Head, Department of Sanskrit and Philosophy

Proposed work

Oscillatory activities in the brain represent our cognition and behaviour. The oscillations coordinate neural connectivity for different cognitive processes. The potential functional relevance of these oscillation during Vedic chanting is unknown. Vedic or Sanskrit Stotra chanting are identified as the mental states or vrittis (मनोवृत्तित्वेमन्त्राणाम्, वृत्तिरेव आवर्त्यत इति मानसो जप उपपद्यते, T.U, Brahmannanda Valli 3.1). It is said that vrittis are instated by yajurmantras. Yajur mantras are knowledge of the Self which is manifested as vrittis through wishful, volitional repeated utterances with organs of articulation, producing meaningful sound with intonation, words, sentences and further through its perception an individual recreates positive thoughts and emotion. We hypothesize that rhythmic articulation of Vedic Stotra may cause robust coordination of brain waves across different brain regions relevant for neural connectivity underlying improved cognitive skills. Earlier a brain neuroimaging study in individuals reading Devanagari scripts showed involvement of both the frontoparietal hemispheres. Our primary objective is to see the oscillatory patterns in these areas. And if any conserved oscillatory signature exists in chanting, then our second objective will be to find its relevance to daily cognition.

Plan of Execution

The participants from the Department of Sanskrit and Philosophy, RKMVERI, BelurMath Campus enrolled in a five-year integrated M.A. Program in Sanskrit under traditional

Sanskrit teaching learning model are recruited voluntarily.. Students with four-five years of chanting practice will undergo electroencephalographic (EEG) recording while they perform Vedic chanting. A five-minute baseline EEG, on-chanting EEG and a five-minute post-chanting EEG will be recorded in a session in each subject. EEG will be repeated in three sessions, each on different days for each volunteer. Later at some point, tasks related to testing memory and attention will be tested in these volunteers. The cognitive tests will last for maximum 30 minutes for each subject. Analysis of the EEG data and memory-attention tests will be performed followed by suitable statistical analysis to understand the brain oscillatory pattern and its relevance to cognition.

Title of project	Investigators
Cognition in Sleep :Yoga-Vedanta vs Scientific Evidences	Swami Vidyapradananda Assistant Professor, Department of Sports Science and Yoga, and Dr Ravindra Pinna Additional Professor Centre for Consciousness Studies NIMHANS Bangalore

Proposed work

Sleep is an interesting phenomena that has been studied from various perspectives, such as medical science,   psychology and consciousness studies, as well as philosophy. Vedanta and Yoga - the two important schools of Indian thought have presented differing viewpoints as to what happens to the Jiva during sleep. The viewpoint of the Upanishads is that the mind does not function during sleep and prana alone is said to be the chief functioning element, whereas the view of Yogic texts is that there is a special kind of functioning of the mind during sleep, along with the functioning of the prana. Upanishads say that during sleep the mind becomes free from diversity of objects and their perceiving subjects and continues to be a mere mass of consciousness. The vital force engulfs the sense organs and the functions of the mind. The mind is then tethered, as it were, to the prana. During deep sleep, the prana is said to go to its seat Brahman and hence a person enjoys bliss. The vital force also keeps the body alive both in dream sleep and deep sleep states.

On the other hand, the viewpoint of the Yogic texts is that although there is no awareness of external objects, sleep is not a state of complete mental void, but a state where there is internal consciousness. This special type of modification of the mind is associated with object-less cognition and memory. So, there is mind function along with the functioning of the prana.

Modern evidence show that although sleep is not a cognitive state, there is a detrimental effect of sleep deprivation, especially on attention, working memory and cognitive

throughput reduce progressively over days of sleep deprivation. Sleep deprivation impairs hippocampal memory function and moreover creative and innovative aspects of cognition are negatively affected

Plan of Execution

Part 1: Developing a theoretical in depth understanding on the cognitive state of mind during sleep - based on Yoga-Vedanta. An article - "*Functions of Mind and Prana During Sleep: Yoga vs Vedanta*" has already been written as a part of research collaboration and knowledge sharing activity under the MoU with CCS-NIMANS.

Part 2: Conducting experiments to determine the sleep related brain constructs that affect memory and cognition,especially study of deep sleep's slow cortical oscillations, thalamocortical spindles, and sharp hippocampal ripples which form the neural bases for memory consolidation.

Courses

The VIVEK-CHATAK center is currently offering following Certificate courses which deal with the Yoga-Vedanta view of consciousness

Name of course	Teacher	Location	Online/ offline
Kathopanishad	Swami Atmapriyananda	RMIC Golpark, Kolkata	Offline
Mandukya Upanishad	Swami Atmapriyananda	Ramakrishna Mission Saradapitha, Belur Math	Offline
Mahanarayana Upanishad	Swami Atmapriyananda	RKMVERI Belur Math	Offline
Yoga Upanishads	Vidyapradananda	RKMVERI Belur Math	Offline

MoU

The VIVEK-CHATAK center signed MoU with the Centre for Consciousness Studies, NIMHANS Bangalore in November 2021 to conduct research in the area of consciousness studies from the dual angle of modern neuroscientific theory and yoga-vedanta perspectives, to find detailed understanding on human brain, mind and behaviour, specifically on neurophysiological, psychological, cognitive and manifested molecular aspects in diversified human subjects

Mission

- To build a platform for multidisciplinary research in the domains of science, humanities and culture pertaining to consciousness by integrating Indian philosophical wisdom with neuroscience,

- To undertake research studies to demonstrate the importance of tradition-based meditation techniques on consciousness and wellbeing,

- To provide leadership in the domains of mind- brain – self and consciousness by creating opportunities for young scientists, faculty and visiting faculty,

- To promote teaching and learning activities in various domains of consciousness,

- To undertake yoga and meditation-based intervention approaches into neuropsychiatric clinics for a holistic approach for research and patient care,

Objectives

- Running and conducting of academic programmes including research and teaching, seminars and symposia,

- Bringing out publications of common interest

- Development and implementation of collaborative research projects in the areas of common interest and methodology

Activities during 2020-2-24

1. One-day Webinar on Consciousness Studies and Research: Ancient and Modern - **30 July 2020** ([details here](#))

2. One-day Webinar on the Four Yogas: Ancient Scriptures & Swami Vivekananda's Modern Interpretation on **22 August 2020** ([details here](#))

3. Swami Atmapriyanandaji delivered a keynote address on *Space-Time-Matter-Consciousness-Continuum--Ancient Philosophical and Modern Scientific Perspectives*" the webinar on 'Concepts of Consciousness: Neuroscience and Indian Philosophical Perspective', organized by CCS-NIHMAHS on 28 September 2021

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4. Swami Vidyapradananda spoke on "*Consciousness during sleep*" in the webinar on 'Concepts of Consciousness: Neuroscience and Indian Philosophical Perspective', organized by CCS-NIHMAHS, on 29 September 2021

6) Centre for Study and Research on Veda-vedanta, Yoga (Viveka-VYASA — Veda-vedanta Adhyayana-Samshodhana-Alaya)

The Department of Sanskrit and Philosophy, School of Indian Heritage, conducted several activities through its Interdisciplinary Centres for Study and Research, like:

1. Certificate Course

2. Special Lectures

3. Extension Lectures

4. Workshops

5. Publications

The details of the above mentioned activities are given below:

1. **Certificate Course**

Sl.	Name of the course and other details	No. of Students	Teaching hours
1.	Preliminary, Communicative Sanskrit offline (Apr – Oct 2023) (at Nivedita Bhavan)	9	63
2.	Preliminary, Communicative Sanskrit online (Apr – Oct 2023) (from Nivedita Bhavan)	70	66
3.	Intermediate, Communicative Sanskrit online (Jan-Jun 2024) (from Nivedita Bhavan)	16	39
4.	Saṃskṛta-Śāstrādhyayana-1 (for monastics only)	36	31

2. **Special Lectures**

Sl.	Topic	Duration	Resource Person	Participants
1	*Śrīmad-bhāgavatam* (series of Special Lectures titled *Śrīmadbhāgavata-rasāsvādanam*)	2 days (One and half hours each day on 15 and 16	Prof.Narottam Senapati, Deptt. Of Sanskrit, Pali and Prakrit, Visva-Bharati	80 (BA, MA students, research

Sl.	Topic	Duration	Resource Person	Participants
		August 2023)		scholars, teachers, and monks)
2	*Nārayaṇīye Śrīmadbhāgavatakathā* (series of Special Lectures titled *Śrīmadbhāgavata-rasāsvādanam*)	3 days (One hour each day on 28, 29 and 30 August 2023)	Dr.K.Unnikrishnan Retd. Vice-Principal, Government Sanskrit College, Thiruvananthapuram, Kerala	80 (BA, MA students, research scholars, teachers, and monks)
3	Advaita - the One and Many'	27 November 2023, from 3.30 to 5.00 PM	Prof. Anantanand Rambachan, Professor Emeritus of Religion, Saint Olaf College, Northfield, Minnesota, United States	80 (BA, MA students, research scholars, teachers, and monks)
4	The Content of the Vedas - *Ṛtam*	15 December 2023, Friday from 11 am to 12.45 pm	Pujaniya Swami Padmanbhanandaji Maharaj, Vice-President of Rishikesh Sivananda Ashrama, The Divine Life Society	80 (BA, MA students, research scholars, teachers, and monks)
5	*Kālagaṇanā: Vaidikī Paddhatiḥ* (Calculation of Time: The Vedic Way)	28 Feb 2024, Wednesday from 3 pm to 4.30 pm	Prof. N.K. Sundareswaran, Professor, Department of Sanskrit, University of Calicut	91 (BA, MA students, research scholars, teachers, and monks)
6.	Vedanta and Indian	28 March 2024,	Śatāvadhānī R Ganesh,	91 (BA, MA

Sl.	Topic	Duration	Resource Person	Participants
	Aesthetics (*Alaṅkāra-Śāstra*)	Thursday, from 2 pm to 4.30 pm	Bengaluru	students, research scholars, teachers, and monks)

3. **Extension Lectures**

Sl.	Topic	Duration	Resource Person	Participants
1	*Vaiyākaraṇabhūṣaṇasāra*	17 days (Two hours each day from 06 July to 22 July 2023)	Prof.Sripada Subrahmanyam, Professor of Sanskrit and Dean (Rtd.), Telugu University	15 (MA students, research scholars, and teachers)
2	The chapter on Rasa in *Sāhityadarpaṇaḥ* *Dhvanyālokaḥ* with the *locana* gloss from the beginning	2 days (Two hours each day on 29, 30 Aug 2023)	Dr.K.Unnikrishnan Retd. Vice-Principal, Government Sanskrit College, Thiruvananthapuram, Kerala	26 (BA, MA students of the programme *MA Integrated in Sanskrit*)
3	*Vaiyākaraṇabhūṣaṇasāra*	5 days (Four hours each day from 24 to 28 September 2023)	Prof.Dattatreya Murthy, Sri Jagannath Sanskrit University, Puri	15 (MA students)
4	*Taddhitaprakaraṇam* in *Vaiyākaraṇa-siddhānta-kaumudī*	10 days (One hour each day from 18 January 2024 to 29 February 2024 from 7 pm to 8 pm, every Tuesday, Wednesday, and Thursday)	Prof. Shivaram Ramakrishna Bhat, Professor and Head of the Department, Department of Research and Publications, National Sanskrit University, Tirupati	11 (4yr and 5yr Vyakarana students)
5	*Dvandva-samāsa*	3 days	Prof. Shivaram Ramakrishna Bhat,	33 (2yr and 3yr

Sl.	Topic	Duration	Resource Person	Participants
		(Two hours each day on 18, 19, and 20 January 2024 from 7am to 9 am)	Professor, National Sanskrit University, Tirupati	students)
6	*Paribhāṣenduśekhara*	3 days (one and half hours each lecture on 18, 19, and 20 January 2024 from 3 pm to 4.30 pm)	Prof. Shivaram Ramakrishna Bhat, Professor, National Sanskrit University, Tirupati	11 (4yr and 5yr Vyakarana students)
7	Technical Terms in *Nyāya-śāstra*	5 days(23 January 2024 to 27 January 2024 from 7 am to 9 am)	Dr. Pushkar Deopujari, Assistant Professor in Vedanta, Calicut Adarsha Sanskrit Vidyapeetha, Balussery Kozhikode, Kerala	53 (2yr to 5yr students)
8	*Vedāntaparibhāṣā*	5 days (23 January to 27 January 2024 from 2.30 pm to 4.30 pm)	Dr. Pushkar Deopujari, Assistant Professor in Vedanta, Calicut Adarsha Sanskrit Vidyapeetha, Balussery Kozhikode, Kerala	19 (3yr, 4yr and 5yr Students)
9	*Taittirīyopaniṣad (Brahmānan-davallī)*	15 days (One hour each day from 26 February 2024 to the first week of May 2024, 2 pm to 3 pm)	Dr. Vishwanath Hegde, Assistant Professor, Sringeri Campus, Central Sanskrit University	6 (5yr students)
10	*Brahmasūtra with Śāṅkarabhāṣya (4th chapter)*	8 days (One hour each day from 26 Feb to 02 Mar 2024 and 14 Mar to 8 Apr 2024 every Mon–Tue–Thu, 3 pm to 4 pm)	Sri. N Kuvalaya Datta, teacher in Samaveda and Advaita Vedanta, Sri Ganapathy Sachchidananda Veda Pathashala, Avadhoota Datta	6 (5yr students)

Sl.	Topic	Duration	Resource Person	Participants
			Peetham, Mysore	

4. Workshops

Sl.	Topic	Duration	Resource Person	Participants
1	International Workshop in *Prauḍhamanoramā (kārakaprakaraṇam)*	15 days (Two hours each day from 6 July 2023 to 22 July 2023)	Prof.Sripada Subrahmanyam, Professor of Sanskrit and Dean (Rtd.), Telugu University, Hyderabad	70 (MA students, research scholars, and teachers)
2	International Workshop in *Tattvapradīpikā (Citsukhī)*	26 days (One hour 15 minutes each day from 10 July 2023 to 10 August 2023)	Dr.Maheswaran, Assistant Professor, The Madras Sanskrit College, Chennai	70 (MA students, research scholars, teachers, and monks)
3	International Workshop in *Mahābhāṣyam (Paspaśāhnikam)*	38 days (One and half hour each day from 31 July 2023 to 16 September 2023 from 7.15 pm to 8.45 pm and 20 September 2023 to 10 October 2023 from 7 am to 8:30 am)	Dr.Padmanabham, Assistant, Professor, Central Sanskrit University, Sringeri Campus	89 (MA students, research scholars, and teachers)
4.	Advaita-Siddhi Selected portions like *jaḍatva-hetuvicāra* in the first pariccheda	17 days (one hour each day from 23 Jan 2024 to 29 Feb 2024, 7 pm to 8 pm, Monday to Thursday every week)	Dr.Pushkar Deopujari, Assistant Professor in Vedanta, Calicut Adarsha Sanskrit Vidyapeetha, Balussery, Kozhikode, Kerala	15 (5yr Vedanta Student, research scholars etc.)
5.	*Vaiyākaraṇa-siddhānta-kaumudī* (starting from	15 days (on hour each day from 12 February 2024 to 20 March 2024, 8	Prof. Chandrashekar Bhat, Professor and Head of the Department,	28 (Students, research scholars, monks)

Sl.	Topic	Duration	Resource Person	Participants
	sannantaprakaraṇam)	pm to 9 pm, Monday to Thursday every week)	Department of Vyakarana, Sringeri Campus, Central Sanskrit University, Sringeri,	

5. Publications

5.1.   In the Publication Cell at Belur Main Campus

5.1.1.   Subhāṣita (3+80+7 pages, Price- 60/-) (Formatting in Latex, proof reading)

5.1.2.   Samādhi (Formatting in Latex, proof reading)

5.1.3.   Laghuvāsudēvamananam (Ongoing) (Proof reading)

5.1.4.   Śāṅkaraprasthānatraya-samvandhabhāṣyasaṁgraha (Proof reading)

5.1.5.   Dīpaśikhā (pañcamaḥ aṅkaḥ) (online Journal) (Formatting, proof reading)

5.2.   In the off campus centre at Nivedita Bhavan

5.2.1.   Vedamūrti-śrīrāmakr̥ṣṇaḥ - (Typing, formatting in Latex, proof reading)

5.2.2.   Samādhi (Typing, formatting in Latex, proof reading)

5.2.3.   Yōgēr kathā - svāmī yatīśvarānanda (Typing, formatting in Latex, proof reading)

5.2.4.   Īśopaniṣad – Brahmacārī-Medhācaitanya – 13 Feb 2024 (Ongoing)

5.2.5.   Yugācārya-Vivēkānanda - 11 July 2023 (Ongoing)

5.2.6.   Vēdāntadarśanam – Translation (Ongoing)