"**Dissemination of Education for Knowledge, Science and Culture**"

-Shikshanmaharshi Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikshan Sanstha Kolhapur's

Raje Ramrao Mahavidyalaya, Jath

Dist.- Sangli. 416404

Internal Quality Assurance Cell (IQAC)

7.3

INSTITUTIONAL DISTINCTIVENESS

7.3 Institutional Distinctiveness

International MoU Response:

To the best of our knowledge, this is the only college in Maharashtra from rural area, which has functional International MoU with foreign University. We have the functional International MoU with Tokyo University of Science, Tokyo, Japan which has Asian University Ranking: 123 and World University Ranking: 751-800.

One of our faculties, Dr. Sanjay S. Latthe has ongoing research collaboration with Prof. Akira Fujishima, President, Tokyo University of Science, Tokyo, Japan since 2013 and published more than 13 research articles in peer reviewed journals in the form of research papers, review articles and book chapters. In connection with previous research collaboration, the Dept. of Physics, Raje Ramrao Mahavidyalaya, Jath has signed 06 years Memorandum of Understanding (MoU) with Photocatalysis International Research Centre (PIRC), Tokyo University of Science (TUS), Tokyo, Japan on 07th December 2016. The MoU is effective up to 31st March 2021. We are glad to mention that, the Department of Physics has organized an International Conference on Advances in Materials Science (ICAMS - 2016) during 7-8 December 2016 and a team of 06 Japanese researchers (TUS) participated in this conference. In the opening ceremony, the MoU was signed on 07th December 2016. Also consecutive Second international Conference on Advances in Materials Science (ICAMS - 2017) during 22-23 December 2017 and a team of 09 Japanese researchers (TUS) participated in this conference. Since then until now 05 International conferences have been arranged.

Current activities under an International MoU

The terms of references of the MoU are specifically Faculty exchange and Collaborative research. Through faculty exchange programme, the mutual transfer of faculty as and when required by the mutual consents of both the institutions will be done. A research in the field of science and technology will be carried out in collaboration. As a quantum part of this MoU, a Japanese “Fujishima-Terashima Award” is announced for students securing highest marks in B.Sc. and M.Sc. (Physics) from Raje Ramrao Mahavidyalaya, Jath by collecting funds (92,000 Japanese Yen) from Prof. Fujishima and Prof. Terashima, TUS, Japan (2016). Under this MoU, Dr. Sanjay Latthe and 07 students (Dr. S. P. Dalawai, Mr. R. S. Sutar, Mr. Chandrakant Barakade, Miss. Mayuri Sutar, Miss. Varsha Patil, Miss. Pratiksha Patil and Miss. Supriya Hipparagi) of our institute were visited Tokyo University of Science, Japan during 2016 to 2019 for research. Dr. Sanjay Latthe has delivered a guest lecturer in TUS. Every year the International Conferences are arranged by Department of Physics and some of the faculties from TUS, Japan participate in the conference by offline and online mode.

The research collaboration under this functional MoU

Accepted Research Article

1) Suresh Gosavi, Rena Tabei, Nitish Roy, Sanjay S Latthe, Yuvaraj M Hunge, Norihiro Suzuki, Takeshi Kondo, Makoto Yuasa, Katsuya Teshima, Akira Fujishima, Chiaki Terashima, "Low Temperature Deposition of TiO2 Thin Films through Atmospheric Pressure Plasma Jet Processing", Catalysts 11 (1), 91, 2021.
2) Takahiro Adachi, Sanjay S. Latthe, Suresh W. Gosavi, Nitish Roy, Norihiro Suzuki, Ken-ichi Katsumata, Kazuya Nakata, Manabu Furudate, Tomohiro Inoue, Takeshi Kondo, Makoto Yuasa, Akira Fujishima, and Chiaki Terashima, "Photocatalytic, Super hydrophilic, Self-cleaning TiO2 Coating on Cheap, Light-weight, Flexible Polycarbonate Substrates", Applied Surface Science 458, 917-923, 2018.
3) Chiaki Terashima, Ryota Hishinuma, Nitish Roy, Yuki Sugiyama, Sanjay S Latthe, Kazuya Nakata, Takeshi Kondo, Makoto Yuasa, Akira Fujishima, "Charge Separation in TiO2/BDD Heterojunction Thin Film for Enhanced Photoelectrochemical Performance", ACS applied materials & interfaces 8 (3), 1583-1588, 2016.

Accepted Book Chapter

1) Sanjay S. Latthe, Kazuya Nakata, Rainer Höfer, Akira Fujishima, Chiaki Terashima, "Lotus Effect-based Super hydrophobic Surfaces: Candle Soot a promising class of Nanoparticles for Self-cleaning and Oil water Separation Applications" in Surface Coatings and Adhesives: Sustainable Technologies and Applications, 2017, Royal Society of Chemistry (RSC), Chapter #, pp. # (Accepted).

Memorandum of Understanding (MoU)

between

Photocatalysis International Research Center (PIRC)

Tokyo University of Science (TUS), Japan

and

Department of Physics

Raje Ramrao College (RRC) Jath, India.

About Photocatalysis International Research Center (PIRC),

Tokyo University of Science, Japan

Tokyo University of Science was established on 1881. The photo catalytic materials have a great potential for industrial applications. The field of photo catalysis can be traced back more than 80 years to early observations of the chalking of TiO_2-based paints and to studies of the darkening of metal oxides in contact with organic compounds in sunlight. The fundamental aspects of photo catalysis on the most studied photo catalyst, TiO_2, are still being actively researched and have recently become quite well understood. New materials have recently been developed based on TiO_2, and the sensitivity to visible light has improved.

At Tokyo University of Science, the Photocatalysis International Research Center (PIRC) was established in 2013. The director of PIRC is Prof. Akira Fujishima. The research of PIRC is focused on to develop the fundamental and applied research of the photo catalysis, like the transparent anti-fogging coating on building's walls and glasses to the purposes of self-cleaning and to develop the efficient photo catalytic materials to purify the environmental air and water. The purification of water and air is most important thrust area of the research. It is found that the photo catalytic materials efficiently work to treat the viruses and cancer cells, thus the photo catalytic application can be extended to the medical cure for the cancer treatment. PIRC has a profound knowledge in the field of photo catalysis and vast experience with the photo catalysis based industries for the development of new photo catalytic products. PIRC is working with many industries that are eager to develop new products using photo catalytic technologies. Also, many international researchers take part in the photo catalytic research in PIRC.

Major Research Projects in PIRC

Self cleaning group

This group develops products whit self-cleaning and/or antibacterial surfaces including window sheet glasses and ceramic tiles. This group also develops simple manufacturing processes for the production of unique surfaces, where photo catalytic self-cleaning and antibacterial properties are combined.

Artificial photosynthesis group

This group develops advanced functional nanostructured visible-light-driven photo catalysts for H_2 generation through water splitting, CO_2 fixation, and green synthesis of organic compounds.

Environmental cleanup group

This group attempts to enhance the use of photo catalysts for water and air pollution control, visible light responsive modified-TiO_2 and non-TiO_2 based materials for environmental and energy applications, and the importance of developing reaction mechanism for a comprehensive understanding and design of the processes.

About Department of Physics, Raje Ramrao College, Jath, India.
(Affiliated to Shivaji University, Kolhapur)

Late Dr. Bapuji Salunkhe established Shri Swami Vivekanand Shikshan Sanstha with the motto "**The propagation of education for knowledge, science and to inculcate the cultural values among the students**". What he said sixty years ago is the need of an hour. The real yardstick of development of the nation is not the number of factories, dams, roads and power houses built in the country but people, their values and their devotion to nation's spiritual and cultural heritage. Educational institution must inculcate the core values of love for the motherland, performance of duty, compassion, tolerance for pluralism, respect for women, honesty, self-reliance, responsibility in action and discipline and sacrifice. Dr. Bapuji Salunkhe was a great visionary. He foresaw the challenges of the society in future and accordingly he composed the prayer of the sanstha.

His Highness Shrimant Raje Ramrao was the Ruler of the Kingdom of Jath. His full name was Shrimant Ramrao Amritrao Dafale. People called him the Maharaja. His son and the last King of the Kingdom of Jath, Shrimant Vijaysingh Raje Ramrao Dafale doled out 28.33 Acres of land with the existing construction on it. In the name of his beloved father, Late Shrimant Ramraoraje Dafale to Shri Swami Vivekananda Shikshan Sanstha for opening the college to benefit the students especially the girl students coming from about 125 odd Villages of Jath Taluka. Dr. Bapuji's hard work, the sincere efforts, his anticipation and the generosity of Shrimant Vijaysingh Raje Dafale, the late king of Jath, resulted into the establishment of the college, Raje Ramrao College, Jath in June, 1969.

Later in 1989, Science wing was added to this college and the department of physics was established in the same year. The first batch of undergraduate physics passed out in 1992 and then after hundreds of students is graduated from this department with Physics as a main subject and now they are placed around the globe. Dr. Chidanand Kanamadi visited South Korea for post-doctoral work, Dr. A. B. Gurav visited China for his post-doctoral work, Mr. Manoj Joshi is in USA, and so many others. Presently the department has post graduate (M.Sc.) course in Physics affiliated to Shivaji University, Kolhapur. This department is recognised centre of research work for doctoral degree of Shivaji Univeristy,Kolhapur from the last three years.

Major Research Projects in RRC

Extremely Wetting and Non-wetting Surfaces: Dr. Sanjay S. Latthe is leading this research group. He and his research group is developing superhydrophobic as well as superhydrophilic coatings for self-cleaning applications. Also his group is engaged in preparing the anti-icing coatings and oil-water separation membranes.

Ferroelectric and Dielectric Materials Group: A group headed by Dr. Shrikant Kokare is synthesizing the new materials for microwave applications. Looking to the hazardous nature of lead, the main thrust is searching for new non-lead based materials which are compatible to lead base materials.

Memorandum of Understanding (MoU)

The authorities of Photocatalysis International Research Center, Tokyo University of Science, Japan and Department of Physics, Raje Ramrao College, Jath, Dist: Sangli, India are hereby signs the Memorandum of Understanding (MoU) between these two institutes on basis of following term of references. The period of effect for this MoU is from the date on which the latter institutions` signature has been executed to March 31, 2021.

Term of References (TOR)

1. **Faculty Exchange:** Mutual transfer of teaching faculty under the faculty exchange programme as and when required by the mutual consents of both the institutes.
2. **Collaborative Research:** A Research in the field of science and technology will be carried out in collaboration with mutual consents of both the institutes.

Date Dec. 2. 2016

Director

Professor Akira Fujishima
Photocatalytic International Research Center
Tokyo University of Science,Noda,Japan

Date 7/12/2016

Principal

Professor Abhaykumar Salunkhe
Department of Physics
Raje Ramrao College, Jath, India
(affiliated to Shivaji University, Kolhapur, India)

catalysts

MDPI

Article

Low Temperature Deposition of TiO_2 Thin Films through Atmospheric Pressure Plasma Jet Processing

Suresh Gosavi [1,2], Rena Tabei [3], Nitish Roy [2], Sanjay S. Latthe [4], Yuvaraj M. Hunge [2], Norihiro Suzuki [2,5], Takeshi Kondo [2,3,5], Makoto Yuasa [2,3,5], Katsuya Teshima [5,6], Akira Fujishima [2] and Chiaki Terashima [2,5,6,*]

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Abstract: Titanium dioxide (TiO_2) has been widely used as a catalyst material in different applications such as photocatalysis, solar cells, supercapacitor, and hydrogen production, due to its better chemical stability, high redox potential, wide band gap, and eco-friendly nature. In this work TiO_2 thin films have been deposited onto both glass and silicon substrates by the atmospheric pressure plasma jet (APPJ) technique. The structure and morphological properties of TiO_2 thin films are studied using different characterization techniques like X-ray diffraction (XRD), X-ray photoelectron spectroscopy (XPS), Raman spectroscopy, and field emission scanning electron microscopy. XRD study reveals the bronze-phase of TiO_2. The XPS study shows the presence of Ti, O, C, and N elements. The FE-SEM study shows the substrate surface is well covered with a nearly round shaped grain of different size. The optical study shows that all the deposited TiO_2 thin films exhibit strong absorption in the ultraviolet region. The oleic acid photocatalytic decomposition study demonstrates that the water contact angle decreased from 80.22 to 27.20° under ultraviolet illumination using a TiO_2 photocatalyst.

Keywords: atmospheric pressure plasma jet technique; TiO_2 thin films; photocatalytic; wettability

Citation: Gosavi, S.; Tabei, R.; Roy, N.; Latthe, S.S.; Hunge, Y.M.; Suzuki, N.; Kondo, T.; Yuasa, M.; Teshima, K.; Fujishima, A.; et al. Low Temperature Deposition of TiO_2 Thin Films through Atmospheric Pressure Plasma Jet Processing. *Catalysts* **2021**, *11*, 91. https://doi.org/10.3390/catal11010091

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1. Introduction

TiO_2 is one of the most studied semiconductor oxide materials due to its vast applications, which include photocatalytic dye degradation, water splitting, self-cleaning agent, dye sensitized solar cells, photocatalytic hydrogen production, etc. Low cost synthesis, biocompatibility and inertness under ambient conditions are additional factors that make it one of the most studied materials [1,2]. Apart from these, it absorbs ultra violet (UV) light significantly so it is usable in cosmetics, such as sunscreen lotion. The UV light absorptions relate to its electronic transition from valence band (VB) to conduction band (CB). VB of TiO_2 is quite oxidative and hence its holes act as strong oxidant under UV light irradiation. Such band-to-band transition of TiO_2 by absorbing UV light and strong oxidant nature of the VB holes are the reasons behind the above-mentioned applications [3,4].

The cost of good quality coating depends on the processing parameters. The low pressure and temperature plasma technique is costly as well as inept due to the expensive vacuum system requirement and, in addition, utilization of different kinds and sizes of

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Full Length Article

Photocatalytic, superhydrophilic, self-cleaning TiO_2 coating on cheap, light-weight, flexible polycarbonate substrates

Takahiro Adachi[a], Sanjay S. Latthe[b], Suresh W. Gosavi[c], Nitish Roy[a], Norihiro Suzuki[a], Hiroshi Ikari[a], Kazuki Kato[a], Ken-ichi Katsumata[a], Kazuya Nakata[a], Manabu Furudate[d], Tomohiro Inoue[d], Takeshi Kondo[a], Makoto Yuasa[a], Akira Fujishima[a], Chiaki Terashima[a,*]

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ARTICLE INFO

Keywords:
Self-cleaning
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Photocatalytic TiO_2
Wetting

ABSTRACT

Photocatalytic TiO_2/SiO_2 coatings with excellent superhydrophilic wettability were prepared on light-weight polycarbonate substrates for self-cleaning applications. The effect of distinct SiO_2 concentrations (0–40%) in TiO_2 on the morphology, wettability, UV–Vis transmittance, haze, and durability of the coatings was studied in detail. TiO_2/SiO_2 coatings prepared with 20% silica in TiO_2 showed superhydrophilic wetting properties with a smooth and uniform morphology with more than 85% transmittance. The lower haze value of TiO_2/SiO_2 coatings confirms their clear optical appearance. A low-friction layer of fluoroalkylsilane was applied to the coatings to improve their mechanical durability. In addition, the hydrophobic-hydrophilic patterns of different areas were prepared to check their effect on the haze and wetting properties.

1. Introduction

Over two decades ago, Fujishima and his research group showed the light-induced wettability change on a TiO_2 thin film surface for the first time [1]. It was reported that the water contact angle (WCA) behaves differently after exposure of the TiO_2 surface to UV light [2]. The hydrophilic TiO_2 film changed to superhydrophilic upon UV irradiation. The reason behind this partial to complete wetting of water on the TiO_2 surface after UV irradiation is that the UV light induces surface oxygen vacancies at the bridging sections of TiO_2 and, hence, radical species can form at the surface, aiding complete water wetting. In addition, the organic pollutants adsorbed on the TiO_2 surface undergo oxidative decomposition after UV irradiation. Total water wetting on the TiO_2 surface forms a continuous, thin water film that carries away dirt particles. This phenomenon is known as the superhydrophilic self-cleaning effect and has been found to be useful for various industrial applications [3]. To date, TiO_2 is one of the few low-cost materials known to show this change in wettability under light illumination.

Optically transparent glass materials have been used in many applications, including automobile windshields, window glass, skyscrapers, microscopes, eyeglasses, solar cell panel covers, kitchen appliances, screens of many electronic devices, and optical instruments [4,5]. Apart from their many uses as forms of glass, they are heavy and, thus, increase the overall weight of a device. Moreover, they are fragile and ultimately prone to break under minimal mechanical force. Hence, extreme care has to be taken to protect them. In addition, much effort is required to keep them clean. However, a light-weight, highly durable surface with good mechanical strength is essential for the aforementioned uses. Expensive, heavy, and fragile glass can be perfectly substituted by inexpensive/low cost, lightweight, and flexible polycarbonate (PC) because of the similar optical transmission of both glass and PC [6]. However, the main issues with PC are its low glass transition temperature (< 145 °C) and poor scratch and photocorrosion resistance [7]. Few reports are available on the progress in increasing the transition temperature [8] and scratch resistance properties of PC [9]. Consequently, detailed and systematic studies still need to be carried out to address this challenge.

An abundance of literature is available on the preparation of self-cleaning TiO_2 coatings on glass substrates [10–13]. Development of photocatalytic, superhydrophilic, and self-cleaning TiO_2 coating on low

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Letter
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Charge Separation in TiO_2/BDD Heterojunction Thin Film for Enhanced Photoelectrochemical Performance

Chiaki Terashima,*[,†] Ryota Hishinuma,[†,‡] Nitish Roy,[†] Yuki Sugiyama,[†,‡] Sanjay S. Latthe,[†] Kazuya Nakata,[†,‡] Takeshi Kondo,[†,‡] Makoto Yuasa,[†,‡] and Akira Fujishima[†]

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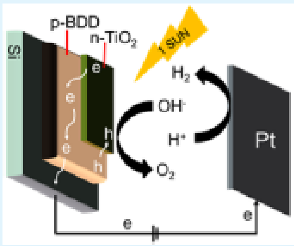
Supporting Information

ABSTRACT: Semiconductor photocatalysis driven by electron/hole has begun a new era in the field of solar energy conversion and storage. Here we report the fabrication and optimization of TiO_2/BDD p-n heterojunction photoelectrode using p-type boron doped diamond (BDD) and n-type TiO_2 which shows enhanced photoelectrochemical activity. A p-type BDD was first deposited on Si substrate by microwave plasma chemical vapor deposition (MPCVD) method and then n-type TiO_2 was sputter coated on top of BDD grains for different durations. The microstructural studies reveal a uniform disposition of anatase TiO_2 and its thickness can be tuned by varying the sputtering time. The formation of p-n heterojunction was confirmed through I−V measurement. A remarkable rectification property of 63773 at 5 V with very small leakage current indicates achieving a superior, uniform and precise p−n junction at TiO_2 sputtering time of 90 min. This suitably formed p-n heterojunction electrode is found to show 1.6 fold higher photoelectrochemical activity than bare n-type TiO_2 electrode at an applied potential of +1.5 V vs SHE. The enhanced photoelectrochemical performance of this TiO_2/BDD electrode is ascribed to the injection of hole from p-type BDD to n-type TiO_2, which increases carrier separation and thereby enhances the photoelectrochemical performance.



KEYWORDS: *BDD, TiO_2, heterojunction electrode, photocurrent, water splitting, photocatalysis, renewable energy*

Photocatalytic properties of TiO_2 semiconductor are continuously and broadly investigated especially after the pioneering discovery made by two Japanese scientists, Fujishima and Honda in 1972. They successfully achieved hydrogen generation through photoelectrochemical water splitting using TiO_2 as a photoanode.[1] Apart from its excellent photocatalytic properties, TiO_2 is primarily used in the paint industry, medical implement of teeth, cosmetics due to its biocomatilibility, chemical stability, and easy fabrication and proven to be no harm to the environment.[2] It has enormous emergent applications which deal with photocatalytic dye degradation, as antifogging or self-cleaning agent, dye sensitized solar cells, and superhydrophilic properties.[3−5] TiO_2 under light illumination with energy greater than its bandgap creates charge carriers (electrons and holes) that undergo a fast recombination process and so provide very small quantum efficiency.[6] To reduce the charge recombination rate and therefore to increase quantum efficiency of TiO_2, making composites with the plasmonic materials for enhanced light scattering properties, heterojunction, faceting different crystal planes or preparing two mixed phases were studied.[7−10] TiO_2 is an n-type wide bandgap material (~3.2 eV) with conduction band (CB) just above the hydrogen evolution potential with respect to standard hydrogen electrode (SHE).[11] On the other hand, boron doped diamond (BDD) is a p-type material (bandgap ~5.5 eV) with very high CB minima (−4 V vs SHE).[12] In spite of the very high CB position, the valence band (VB) of diamond or BDD lies near +1.5 V vs SHE, thereby making it a poor photooxidant catalyst, unlike TiO_2 (VB position at +3 V vs SHE and thereby strong photooxidant candidate).[11] Boron is adequately used as p-type doping material to synthesize BDD because of its small covalent radius. BDD can act as a p-type semiconductor electrode with minute background current, high thermal conductivity, wide potential window, excellent long-term stability against mechanical damage and corrosive solutions.[13] Therefore, very high stability of p-type BDD could be utilized by preparing p−n junction with a very strong photooxidant n-type TiO_2 to enhance its photoelectrochemical water splitting activity.

In a recent review article,[14] Wang et al. have thoroughly discussed about the design and development of various efficient and stable semiconductor heterojunction photocatalyst for hydrogen production, pollutant degradation and photocatalytic disinfection. An ideal heterojunction system should have high rectification ratio with small leakage current. The rectification property/ratio greatly depends on nature of the semiconductors and charge transfer at heterojunction. Uniform, stable and proper contact at the junction is desirable and expected to fabricate the good quality p−n junction devices. Few studies on p−n junction with p-type BDD and n-type

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CHAPTER 5

Lotus Effect-based Superhydrophobic Surfaces: Candle Soot as a Promising Class of Nanoparticles for Self-cleaning and Oil–Water Separation Applications

SANJAY S. LATTHE[a], KAZUYA NAKATA[b], RAINER HÖFER[c], AKIRA FUJISHIMA[b] AND CHIAKI TERASHIMA*[b]

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5.1 Introduction

Nature has blessed lotus leaves and many plants, animals and other organisms with excellent self-cleaning abilities. The lotus plant (*Nelumbo nucifera*) is revered in Asia for its exceptional cleanness. Although it grows

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Best Practices _ Sakura Exchange Programme, Japan

"Japan-Asia Youth Exchange Program in Science" (Sakura Exchange Program in Science) administered by Japan Science and Technology Agency (JST) during 02nd – 22nd October 2016 in Tokyo University of Science, Noda, Japan.

"Japan-Asia Youth Exchange Program in Science" (Sakura Exchange Program in Science) administered by Japan Science and Technology Agency (JST) during 14th November – 04th December 2017 in Tokyo University of Science, Noda, Japan.

"Japan-Asia Youth Exchange Program in Science" (Sakura Exchange Program in Science) administered by Japan Science and Technology Agency (JST) during 10th June 2018 – 30th June 2018 in Tokyo University of Science, Noda, Japan.

"Japan-Asia Youth Exchange Program in Science" (Sakura Exchange Program in Science) administered by Japan Science and Technology Agency (JST) during 21st November 2019 – 01st December 2019 in Tokyo University of Science, Noda, Japan.

Fujishima – Terashima Award on 06th December 2016

Fujishima – Terashima Award on 22nd December 2017

Fujishima – Terashima Award on 27th December 2018

Fujishima – Terashima Award on 20th January 2020

***Guest Lecture on "SLIPS Technology for Anti-icing Coatings" on 10th October 2016 at Photocatalysis International Research Center (PIRC), Tokyo University of Science, Noda, Japan*.**

Chiaki Terashima, Ph.D
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Dr. Sanjay S. Latthe,
Assistant Professor,
Dept. of Physics,
Raje Ramrao College, Jath, 416404.
Maharashtra, India.

10th October 2016

Thanking Letter

Dear Dr. Sanjay S. Latthe,

On behalf of the Photocatalysisc International Research Center (PIRC), Tokyo University of Science, I would like to thank you for giving guest lecture on *"SLIPS technology for anti-icing coatings"* on 10th October 2016. Your lecture was well attended and appreciated by our faculty, staff and students. We are looking forward to see you again in our campus.

Yours sincerely,
Chiaki Terashima, PhD

Guest Lecture on "Candle Soot Based Superhydrophobic Coatings for Self-cleaning Applications" on 27th November 2017 at Photocatalysis International Research Center (PIRC), Tokyo University of Science, Noda, Japan.

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Date: 28th November 2017

To,
Dr. Sanjay S. Latthe,
Assistant Professor,
Dept. of Physics,
Raje Ramrao College, Jath, 416404.
Maharashtra, India.

Thanking Letter

Dear Dr. Sanjay S. Latthe,

On behalf of the Photocatalysis International Research Center (PIRC), Tokyo University of Science, I would like to thank you for giving guest lecture on *"Candle Soot based Superhydrophobic Coatings for Self-cleaning Applications"* on 27th November 2017. Your lecture was well attended and appreciated by our faculty, staff and students. We are looking forward to see you again in our campus.

With best regards

C. Tera 寺島千晶

Chiaki Terashima, PhD

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Guest Lecture on "Superhydrophobic surfaces for self – cleaning and oil – water separation applications" on 12th June 2018 at Photocatalysis International Research Center (PIRC), Tokyo University of Science, Noda, Japan.

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Date: 12th June 2018

To,
Dr. Sanjay S. Latthe,
Assistant Professor,
Dept. of Physics,
Raje Ramrao College, Jath, 416404.
Maharashtra, India.

Thanking Letter

Dear Dr. Sanjay S. Latthe,

On behalf of the Photocatalysis International Research Center (PIRC), Tokyo University of Science, I would like to thank you for giving guest lecture on *"Superhydrophobic surfaces for self – cleaning and oil – water separation applications"* on 12th June 2018. Your lecture was well attended and appreciated by our faculty, staff and students. We are looking forward to see you again in our campus.

With best regards

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