DETAILED PROPOSAL

Center for Astronomy, Space Science and Astrophysics (CASSA)

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9 July 2025
Approved by Academic Council

Executive Summary

This proposal outlines the establishment of the Center for Astronomy, Space Science and Astrophysics (CASSA) as an autonomous, multidisciplinary research and capacity-building center at Independent University, Bangladesh (IUB). CASSA will leverage IUB's unique existing strengths, including the nation's only in-country astronomer, dedicated high-performance computing, and an undergraduate specialization in Astronomy and Astrophysics. CASSA's vision is to be a pathfinder in Bangladesh, impactful in South Asia, and integrated within the international astronomy and space science community. Its missions encompass cutting-edge research (observation, theory, instrumentation, and simulation), contributing to the relevant academic programs, and engaging the public through diverse outreach activities.

CASSA builds upon five years of successful research, teaching, and outreach initiatives at IUB, previously operating as the Astronomy Research Group, IUB (ARGI) and the Computational and Observational Astronomy Lab (COALab) which were part of the Department of Physical Sciences (DPS). These precursors have secured significant funding (BDT 10.8 million), demonstrating growing national and international recognition.

The proposal details CASSA's foundation in completed projects, its operational guidelines ensuring administrative autonomy under the Vice Chancellor with academic affiliation with the academic departments of the School of Engineering, Technology and Sciences (SETS) and its organizational structure comprising a director, core and associate members, a system administrator/secretary, and student researchers. CASSA's existing premises and assets, including a dedicated office, HPC server, and telescopes, are also outlined.

An annual budget of BDT 16 lakh is proposed to maintain assets, support personnel, and facilitate events. A cost-benefit analysis demonstrates a strong return on past investments (benefit-cost ratio, BCR ~ 1.0), with significant qualitative benefits in enhanced IUB ranking and branding. Future projections indicate a potentially higher BCR (~ 1.5) through increased tuition revenue from outreach programs, mini-courses and workshops, and research grants. Besides the obvious quantitative BCR, CASSA has already contributed to the qualitative benefits of IUB by enhancing its research reputation; more than ten recent high-impact publications by CASSA members, including one in *Nature*, and significant media coverage underscore the center's potential to elevate IUB's national and global profile.

In conclusion, this proposal argues that establishing CASSA is a strategic imperative for IUB. It builds on a proven track record, optimizes existing resources, **positions IUB as a national leader** in burgeoning fields, and promises both financial returns and significant qualitative benefits through enhanced academic reputation and global visibility. CASSA represents a flagship opportunity for IUB to make a substantial contribution to astronomy, space science, and astrophysics in Bangladesh and beyond.

Introduction

The Center for Astronomy, Space Science, and Astrophysics (**CASSA**) will be an autonomous multidisciplinary research and capacity-building center of Independent University, Bangladesh (IUB), dedicated to the *intermingled* fields of 'astronomy and astrophysics' (**A&A**), and 'space and planetary science and engineering' (**SPaSE**), as defined in **CASSA Constitution** (CC). It will consist of researchers and faculty members from various departments of IUB and from renowned universities in other countries. IUB is uniquely positioned to lead this frontier in Bangladesh, as it is home to the nation's only astronomer primarily working within the country since 2020, only high-performance computer dedicated to A&A and SPaSE, and only undergraduate specialization program in A&A since 2023.

CASSA is the culmination of research, teaching and outreach activities at IUB conducted over the last five years. It replaces and builds on its **precursors**: the Astronomy Research Group, IUB (**ARGI**) established in 2020, and the Computational and Observational Astronomy Lab (**COALab**) founded in 2023. Over the past five years, these precursors secured 1,08,00,000 BDT worth of financial grants and assets, including 10 lakh BDT from the government of Bangladesh and 24 lakh BDT from an international organization, underscoring their growing national and global recognition. In this detailed proposal we describe (1) the foundation, (2) the operational guidelines, (3) the organizational structure, (4) the vision and the missions, (5) the annual budget, and (6) a cost-benefit analysis including the pathway to achieve financial independence.

1. Foundation

CASSA will be the culmination of five years of research, teaching and outreach at IUB in the fields of A&A and SPaSE. The following **six research and outreach projects**, already completed, are its foundation.

Projects	**Year**	**Fund (BDT)**	**Funding source and details**
Project A	2020	10,00,000	ICT Innovation Fund of the Government of Bangladesh (GoB) through the Center for Computational and Data Sciences (CCDS) and Dr. Asad (PI).
Project B	2021	10,00,000	IUB Sponsored Research Grant for 'Analyzing big data from the international LOFAR and SKA telescopes' through Dr. Asad (PI).
Project C	2022	6,00,000	IUB Sponsored Research Grant for 'Capacity building for astronomical research and collaboration' through Dr. Asad (PI).
Project D	2023	24,00,000	University of Toronto seed grant through Dr. Mowla (PI), Dr. Asad and CCDS that includes two smart outreach telescopes.
Project E	2023	7,00,000	IUB Sponsored Research Grant for 'Analysing the Universe: Data, Interpretation, Theory (AUDIT)' through Dr. Momen (PI).
Project F	2024	51,00,000	IUB Planning & Development Dept. allocated the funds from IUB Overall CapEx through Dr. Asad (project lead) for the construction of CASSA on IUB rooftop.
Total funds		**1,08,00,000**	**One crore and eight lakh / 10.8 million BDT**

A more detailed background of these projects is given in **Appendix A** as part of a continuous history.

2. Operational Policies

The operational policies of CASSA are given in Section A of CC. Here we describe its key points.

CASSA will be an **autonomous research center** of IUB working directly under the **Office of the Vice Chancellor** (VC). The autonomy entails that CASSA will be **administratively independent**, but one or more academic departments can have **academic affiliations** with CASSA.

The key clauses of CC related to the Administrative Independence of CASSA are summarised below.

1. The assets of CASSA will be maintained by the director of CASSA.
2. The director of CASSA will be the main signatory for all CASSA memos.
3. IUB Management will contact CASSA directly about all activities related to CASSA.

The key clauses of CC related to the Academic Affiliations of CASSA are summarised below.

1. Any department can apply to CASSA for academic affiliation and, conversely, CASSA can apply to the department for its academic affiliation.
2. CASSA will contribute to the research components of the relevant courses of the department.
3. The department will get affiliations in CASSA papers.

3. Organizational Structure

CASSA will consist of core members and associate members, and it will be managed by a director. Additionally, it will have students, a system administrator, listed below.

1. **Core Members (CM):** they will be full-time PhD faculty members from an academic department of IUB, who are either specialists in A&A or SPaSE, or have substantial collaborations with CASSA. Their roles are defined in Clause 7 of CC.

2. **Director:** the core members (CM) of CASSA who have doctoral degrees and postdoctoral research experience in A&A or SPaSE, and shown substantial leadership capabilities as a CM, can be a director of CASSA. The director will be elected from the core members once every two years and the director will be the main signatory on behalf of CASSA in all official memos. More details about the director are given in Clause 8 of CC.

3. **Associate Members (AM):** they will be postdoctoral researchers or PhD faculty members within the fields of A&A and SPaSE, at any university in the world, or researchers who collaborate with CASSA substantially and use CASSA as one of their affiliations when appropriate. Their roles are defined in Clause 9 of CC.

4. **System Administrator and Secretary (SAS)**: this person will be a computer engineer appointed by IUB solely for CASSA and the primary duties of the position will be managing the high-performance computing (HPC) server(s) and the in-house telescopes of CASSA, and working as a *secretary* under the supervision of the director. The eligibility criteria and the duties are elaborated in Clause 11 of CC.

5. **CASSA Students** can work part-time or full-time in the following capacities (their pay scale is given in Clause 12 of CC).
    a. Graduate Research Assistant (GRA, paid) or Graduate Research Intern (GRI, unpaid)
    b. Postbac Research Assistant (PRA, paid) or Postbac Research Intern (PRI, unpaid)
    c. Undergraduate Research Assistant (URA, paid) or Research Intern (URI, unpaid)
    d. Student on Duty (SOD) will only be for IUB students.

Premises and Assets

A complete list of the existing assets of CASSA can be found in Annexure 3 of CC. Here we provide the most important information.

Asset	Cost	Source of fund
CASSA Office Including AC and furniture	৳5,100,000	IUB Overall CapEx (through P&D)
CASSA Office IT and multimedia equipment	৳1,000,000	IUB Overall CapEx (*under review*)
HPC server Timaeus	৳1,030,000	Dr. Asad's IUB Sponsored Research Grant (70%) and DPS (30%)
Smart reflecting telescopes Ashvin 1 & 2	৳900,000	University of Toronto (70%), and DPS (30%)
Small radio telescope START	৳400,000	DPS (70%), Fab Lab IUB (30%)

Interdepartmental Collaboration

For research, teaching, and outreach, CASSA will collaborate with various academic entities of IUB. The scope of these collaborations are given below.

#	Department / School	Area of collaboration	Type
1	Computer Science and Engineering	Data-intensive astronomy and space science	RT
2	Economics	Space economy	RO
3	Electrical and Electronic Engineering	Space science, radio astronomy, astrophotonics	RT
4	English and Modern Languages	Cultural astronomy	RTO
5	Environmental Science and Management	Earth and planetary science	RT
6	Life Sciences	Astrobiology	RT
7	Media and Communication	Astrophotography	TO
8	Physical Sciences	Astrophysics and cosmology	RT
9	School of Business	AST 100, Space economy	RTO
10	Social Science and Humanities	Astrosociology and archaeoastronomy	RTO

Legend: 'R' stands for research, 'T' for teaching, and 'O' for outreach.

4. Vision and Missions

The vision of CASSA is to be the pathfinder in Bangladesh, be impactful in South Asia, and be a part of the international community in the fields of A&A and SPaSE. Detailed visions and missions are given in the constitution. Here we summarised the key points.

Mission 1: Research

The research mission of CASSA is to conduct cutting-edge research in observation, theory, instrumentation, and simulation (OTIS), and to publish results in peer-reviewed international journals and conference proceedings.

Short-term Research Objectives

1. Acquire research funds from IUB, the Government of Bangladesh, and international organizations through grant applications submitted by the core and associate members.
2. Upgrade and utilize the existing High-Performance Computing (HPC) resources to publish research in high-impact journals, thereby enhancing IUB's academic reputation and institutional ranking.
3. Hire top-tier research assistants (RA) for the existing projects of CASSA.
4. Organize CASSA colloquiums, workshops and tea talks on a regular basis.
5. Develop the capability to manufacture radio and optical telescopes in collaboration with Fab Lab, enabling their export to institutions both nationally and internationally.

Long-term Research Goals

1. Organize international conferences related to different fields of A&A and SPaSE.
2. Acquire more HPCs to build a supercomputing cluster.
3. Build a small educational observatory on the premises of CASSA.
4. Establish a research-grade observatory equipped with a 2-meter class telescope in a remote location with the help of the newly recruited faculty in optical astronomy. This will be a crucial addition in making valuable contributions for the transient follow-ups of the Legacy Survey of Space and Time (LSST).
5. Collaborate with space agencies and astronomy organizations, for example, NASA, International Astronomical Union (IAU) and the Square Kilometre Array Organization (SKAO).

Mission 2: Teaching

The teaching mission of CASSA is to contribute to the development of courses related to A&A and SPaSE offered by various academic departments of IUB.

Short-term Teaching Objectives

1. Contribute to the research components of the MSc in the fields of A&A and SPaSE to be offered by the Department of Physical Sciences.
2. Contribute in the research components of the Data-Intensive Astronomy and Space Science Track (DIASS) within the MSc in Data Science and AI proposed by the Dept. of CSE.
3. Contribute to the research components of the relevant courses of the Department of EEE.
4. Organize workshops and mini-courses featuring renowned instructors from various countries.

Long-term Teaching Goals

1. Work with the departments to develop a roadmap to offer a PhD degree in the area of A&A or SPaSE. Supervisors for a PhD candidate will consist of a core and an associate member of CASSA.
2. Develop facilities so that various departments of IUB can offer more advanced courses related to A&A and SPaSE in future.
3. Organize regular summer/winter schools to enhance students' learning, featuring renowned researchers from various countries.

Mission 3: Outreach

The outreach mission of CASSA is to engage students from schools and other universities and the public, and to use popular science for the enlightenment and development of society through various outreach events, images and articles.

Short-term Outreach Objectives

1. Organize regular Astronomy Nights and other outreach events at the CASSA office.
2. Use the small radio telescope and optical telescope on the rooftop effectively for public engagement.
3. Publish popular science books and articles in Bengali on a regular basis.

Long-term Outreach Goals

1. Acquire more outreach funds for the Durbin program (Project D).
2. Hire a part-time astrophotographer for public engagement.
3. Acquire funds for better management of the Bangladesh Olympiad on Astronomy and Astrophysics (BDOAA) for high-school and college students.

5. Annual Budget

We propose the following annual budget for CASSA.

#	Item	Annual cost	Type
1	Maintaining and upgrading the fixed assets of CASSA	৳400,000	CapEx
2	Salary for a combined System Administrator, Secretary, and Research Assistant position	৳600,000	OpEx
3	Students on Duty (SOD)	৳200,000	OpEx
4	Events (outreach, workshops, etc.)	৳300,000	OpEx
5	Printing, branding and publicity	৳100,000	OpEx
	Total: 16 lakh BDT	**৳1,600,000**	

The rationale behind each item is given below.

1. The computing resources and astronomical instruments must be upgraded annually in order to increase our research capacity. This fund will be used for maintaining the furniture and other civil assets as well.
2. A single person can act as the system administrator of the computing and astronomical resources, and the secretary to the director. This person can also engage in research. We would like to utilize the expenditure for the maximum benefit of both IUB and the employee. The position can be advertised for 2 years, and can become permanent upon good performance.
3. SODs will coordinate the outreach events.
4. CASSA will organize at least 15 events each year for both research and outreach.
5. CASSA is one of the most well-known entities of IUB nationwide and even internationally; IUB's reputation will be boosted if CASSA is advertised effectively.

6. Costs and Benefits

The cost-benefit analysis (CBA) is given in two stages. First, we show that the past expenditures over the last 5 years are justified given the benefits over the same period. Next, we describe the plan for the future and the financial independence of CASSA.

Past analysis

Projects	Year	Cost (BDT)	Benefits
Project A	2020		**10,00,000** BDT
Project B	2021	10,00,000	A high-performance computer (HPC) that has already produced research and high-impact publications, and will do so for 10 more years. The HPC will be upgraded regularly. **Six papers in Q1 journals.**
Project C	2022	6,00,000	Starting the Durbin project in collaboration with University of Toronto from where IUB received two telescopes and in financial grants for astronomy outreach. The telescopes were used for the course AST 100 which has been taken by 417 IUB students so far generating a revenue of **75,06,000 BDT** for Physical Sciences dept.
Project D			**24 lakh BDT** (benefit of Project C, two telescopes and a seed grant from Toronto); ten Astronomy Nights (public outreach events with more than 100 attendants in each event), branding, publicity.
Project E	2023	7,00,000	High-impact publications. **Three papers in Q1 journals.**
Project F	2024	51,00,000	Bangladesh's first research center for A&A and SPaSE together, and first radio telescope for research and education. The constructed room will be used as research workspace, as classroom in the TEAL model, and as viewing room during Astronomy Nights.
Total cost		**74,00,000**	**1,09,00,000**

Over the last five years, the total benefit is **BDT 1,09,00,000**, but we have to deduct the IUB expenses from the 75 lakh BDT earned from tuition fees. Deducting 33 lakh for the expenses of IUB, one can benefit from 42 lakh from the tuition fees of AST 100. The total benefit over the last 5 years is approximately 76 lakh BDT. Over the last 5 years (2020–2024), the **quantitative** benefit-cost ratio, **BCR, is almost 1.0 (76/75)**.

However, the **qualitative benefits** should be given more importance, because both the **ranking** (9 high-impact papers) and **branding** (outreach, astronomy nights) of IUB have been shaped over the last 5 years because of its astronomy.

Future projection

As mentioned above in Section 5, we are asking for an annual budget of **16 lakh BDT** for the first year starting from July 2025. The revenue estimation for a year is given below.

Item	Units	Revenue	Total	
1	10	৳50,000	৳*500,000*	Outreach courses, minicourses or workshops
2	2	৳1,000,000	৳*2,000,000*	Research grants
			৳2,500,000	

With this estimate, our **quantitative BCR could be 1.5** (25 / 16 in lakhs). More information about the items in the table are given below.

1. These revenues of CASSA are earned from outreach courses or minicourses and workshops that are offered outside any degree granting program of IUB.
2. The research grants of 20 lakh BDT is a conservative estimate which we will review after a year.

However, we would like to emphasize that the CBA above does not take into account the **qualitative benefits** which are significant in our case. IUB has become well-known for its astronomy which will only increase in the future. We list the key qualitative benefits below.

1. CASSA members have already published **12 papers** in the most renowned international journals of A&A from December 2024 to June 2025, even before the formal approval of the center. One of these was published in *Nature* and was covered by *Reuters* and *BBC* among others. CASSA papers are published in the best journals of the world, hence, they will be extremely beneficial for the **ranking** of IUB.
2. The news about CASSA has already created a stir in the local and global **media**. The Business Standard and Prothom Alo published feature articles, and Jamuna TV broadcast an interview of CASSA members. A French production company recently visited CASSA and took more than 7 hours of footage in order to make a documentary over the next 6 months; they will visit us again in September 2025. Such coverage is possible because IUB is the **first and only place in Bangladesh** where a center is being established on these subjects with internationally recognized experts. These demonstrate CASSA's significant contribution to IUB's overall **branding**.
3. Improved overall ranking and branding will enable CASSA to secure more substantial long-term funding for research-grade observatories.

Conclusion

In this detailed proposal we have described the background of astronomy education, research and outreach over the last 5 years, and presented the rationale behind establishing the Center for Astronomy, Space Science and Astrophysics (CASSA). The main objectives and goals of the center have been outlined, and the organizational structure has been described. A cost-benefit analysis was given for the past and future.

We would like to emphasize that CASSA represents the culmination of five years of astronomy-related activities at IUB. Over this period, IUB has invested 74 lakh BDT in astronomy initiatives, yielding a return of more than 1 crore BDT—75 lakh BDT from an astronomy course and 21 lakh BDT from Canadian funding. Building on this success, we are confident that establishing this center will bring not only financial returns but also the invaluable qualitative benefit of enhanced reputation. CASSA has the potential to serve as a flagship mission for IUB, positioning the university as a national leader in astronomy, astrophysics, and space science and engineering.

Appendix A: Background

CASSA will be the culmination of five years of pioneering research, teaching and outreach at IUB in the field of A&A and SPaSE. We are briefly summarizing these years as a background to the rationale for this center as a continuous story.

2020: At the recommendation of Prof. M Arshad Momen, Dr. Khan Asad joined IUB becoming the only observational astronomer and astrophysicist working in Bangladesh. Dr. Asad started the Astronomy Research Group, IUB (ARGI) and received a grant of 10 lakh BDT from the ICT Division of the

Government of Bangladesh in collaboration with Prof. Md Ashraful Amin of CCDS. The project—hereafter, Project A—was about the use of machine learning in astronomy.

2021: Asad published a key paper on the MeerKAT telescope of South Africa and received a grant of 10 lakh BDT from IUB as the PI of the project titled 'Analyzing big data from the international LOFAR and SKA telescopes to improve our understanding of the history and large-scale-structure of the universe' (Project B). The fund was used to purchase a High-Performance Computer (HPC) called *Timaeus*, currently located at the Data Center of IUB.

2022: A key paper was published using the image of the center of our Galaxy taken by the MeerKAT telescope, where Dr. Asad was a co-author. The news was covered by prominent international media, including the *New York Times*. Dr. Asad received a fund of 6 lakh BDT from IUB as the PI of the project 'Capacity building for astronomical research and collaboration by establishing an observatory on IUB-rooftop for transient observations' (Project C). Dunlap Institute for Astronomy and Astrophysics, University of Toronto, signed a Letter of Agreement (LOA) with IUB through Dr. Lamiya Mowla, a postdoc at Dunlap at the time, Dr. Asad and the Center for Computational and Data Sciences (CCDS). As part of the LOA, Dunlap sent two Unistellar eQuinox telescopes (costing ~ 7 lakh BDT) and around 14 lakh BDT to IUB for starting an outreach program called 'Durbin' (Project D). Dr. Asad visited Dulap as a guest speaker at the invitation of Dr. Mowla.

2023: Dr. Mowla visited IUB and the Durbin program was inaugurated at the auditorium in the presence of the then VC of IUB, Prof. Tanweer Hasan. The event attracted more than 500 participants. A Minor in Astronomy and Astrophysics (A&A) was approved by UGC and the first courses of the minor were offered. With the HPC *Timaeus* and the Minor program, Dr. Asad established the Computational and Observational Astronomy Lab (COALab) which replaced ARGI. And he transformed the General Education (GED) course PHY 100 using the telescopes of Durbin, by co-offering it with AST 100. AST 100 started attracting almost 80 students from the school of business every trimester. Prof. Momen, Dr. Asad and Dr. Ghosh together started a project titled 'Analysing the Universe: Data, Interpretation, Theory' (AUDIT) which will be referred to as Project E; IUB granted 7 lakh BDT for this.

2024: As part of Project C (Dr. Asad as PI) and Project D (Dr. Mowla as PI), the campaign to build a room on the rooftop of the academic building of IUB continued. Durbin organized 10 Astronomy Nights, public outreach events where guests listen to a public talk and participate in stargazing through smart telescopes from IUB rooftop. The room on the rooftop was originally proposed for organizing these events. With the support from the then VC, the Trustees, and Prof. Arshad Momen, the plan was extended to include teaching and research as part of this rooftop room. The construction of this room will be referred to as Project F, which builds on Projects C and D. We are summarising the key developments of Project F below.

2024, Mar - Aug: After their 157th Meeting, the Planning and Development Committee (P&D) requested a complete proposal of Project F as an 'Astronomical Research Lab.' Dr. Asad designed the room so that it could be used for research (workspace), teaching (some courses on A&A) and outreach (astronomy nights), and submitted the proposal to the Operations and Maintenance Dept. (O&M) with Prof. Momen. O&M prepared a design and a cost estimate of 51 lakh BDT based on the proposal.

2024, Sep - Oct: Because of this high expense, Dr. Asad analyzed the cost estimate of O&M from an academic perspective and came to the conclusion that the Return on Investment (ROI) would be justifiable only if the newly built room was designated as a new 'research center' of IUB (the detailed rationale behind this is given in Appendix B). Following the academic rationale, a detailed constitution of CASSA was drafted by Dr. Asad in collaboration with the potential members of CASSA: 3 core members and 8 associate members. An invitation was sent to all faculty members of the School of Engineering, Technology and

Sciences (SETS), and the faculties who showed interest were included as associate members. The resulting proposal of CASSA was submitted to the VC (acting) on 16 Oct. At the same time, the construction of a radio telescope on the premises of CASSA began in collaboration with DPS and Fab Lab, IUB.

2024, Nov - 2025 Mar: The proposal of CASSA was discussed in the 159th P&D meeting where Dr. Asad presented the proposal in front of the trustees Mr. Lutfe M Ayub, Mr. Rashed Chowdhury and Mr. Javed Hosein. After this meeting, the budget was approved, and P&D requested that O&M begins construction without any delay. The civil construction was completed on 6 Mar. The designation of this room is still unclear because the P&D Committee could approve the budget for construction, but not a new center itself. For further approval, Dr. Asad was invited to the 95th meeting of the Board of Trustees (BOT) on 1 Dec, and he presented CASSA there. On 22 December, an official extract of the minutes of this meeting was sent to Dr. Asad. The BOT resolved that 'the proposal of opening the center will be kept in abeyance' and 'a detailed proposal along with financial projection should be placed in the subsequent meeting of the Board through the Academic Council (AC) and the Syndicate for review and consideration.'

2025 Apr: The VC of IUB Prof. M Tamim visited the faculty members of DPS during a meeting of its Department Meeting on 10 April, and requested that the proposal of this center should be submitted soon to the AC after an approval from the DAC of DPS. An initial proposal and constitution of CASSA were discussed in the DAC meeting of DPS held on 17 April. Based on the inputs of this meeting, Dr. Asad edited the documents and emailed them to the faculties of DPS for further comments with a deadline of 15 June. Moreover, two core members of CASSA met the honorable VC and the VC instructed that he will process the approval of the center through the Academic Council himself, if the departments of SETS submit formal letters to the VC endorsing the center.

2025 Jun: After 15 June (deadline for comments from DPS), Dr. Asad edited the documents further and the current Detailed Proposal is the result of these edits. CASSA approached the three departments of SETS and submitted this proposal and the constitution so that each department can discuss these at their respective DACs.

PS: Pending the official approval, CASSA is carrying out its operations unofficially because of two reasons. First, the construction on the rooftop of IUB, and the budget of this construction has been approved under the name of CASSA. Second, the affiliation of CASSA had to be used in a groundbreaking paper published in *Nature* by Dr. Mowla which was covered by Reuters and BBC. This could become an IUB-affiliated paper only through CASSA. Following this achievement, CASSA organized 6 colloquia and these events attracted a lot of publicity in the media. The papers of Dr. Mowla and Dr. Shajib were publicized by the Media and Public Relations Dept. of IUB widely. Five Associate Members of CASSA—Dr. Ahad, Dr. Mowla, Dr. Uddin, Dr. Bahauddin and Dr. Karim—visited IUB for their colloquia. And the fabrication of the radio telescope to be installed on CASSA premises is nearing completion.

Appendix B: Summary of the rationales behind CASSA

1. **Return on Investment (ROI):** IUB has already invested 74 lakh BDT across the aforementioned projects. The quantitative and qualitative returns on this investment can only be assured through CASSA, as outlined below.
    a. **Quantitative ROI:** Once established, the center can attract funds from national and international agencies; people affiliated with CASSA already received a total of **31 lakh BDT** (Projects A and D) from national and international entities. The telescopes attracted more than 400 students to AST 100 generating a revenue of almost **75 lakh BDT**.

    b. **Qualitative ROI:** Establishing a new center will significantly enhance IUB's branding, elevating its *reputation, prestige and visibility*. This potential has already been demonstrated by the attention and publicity garnered by CASSA, even in its unofficial capacity.
2. **Resource Optimization:** Without establishing a dedicated center, the aforementioned 74 lakh BDT and the resulting assets cannot be utilized effectively, and the specially designed room intended for this purpose risks becoming underutilized or falling into disrepair.
3. **Strategic Leadership in Bangladesh:** A dedicated center will give IUB the **first-mover advantage** by positioning it as a national leader in A&A and SPaSE — fields that are currently underrepresented in Bangladesh. With growing interest in space exploration and satellite technology, IUB can fill the gap by making CASSA one of its flagship initiatives.
4. **Global Reputation and Visibility:** Astronomy is an inherently inspiring field that captures public imagination and garners significant media attention. A&A and SPaSE often involve international networks and collaborations (e.g., with organizations like NASA, ESA, SKAO, or IAU), which can raise IUB's academic standing. CASSA has already been mentioned in a Reuters news article. CASSA has 8 associate members, 5 of whom work in North America.
5. **Interdisciplinary Opportunities:** The fields of A&A and SPaSE intersect with physics, computer science, engineering, life sciences and environmental science. The fields of A&A and SPaSE are a leader in big data analytics and computational science, which can strengthen IUB's programs in data science, artificial intelligence, and machine learning. The center can drive innovations in satellite design, remote sensing, and space exploration technologies, benefiting multiple disciplines including electrical engineering.
6. **Research and Ranking:** Astronomers and astrophysicists are highly active contributors to the international scientific community. The center can attract high-quality faculty specializing in cutting-edge research areas. Notably, some Associate Members of CASSA already list CASSA, IUB as one of their affiliations. By leveraging the expertise of both core and associate members, IUB can contribute to high-impact publications, thereby significantly enhancing its global ranking.
7. **Alignment with National and Global Goals:** A center for astronomy aligns with the country's vision of technological and scientific advancement. The center can contribute to education (Sustainable Development Goal, SDG 4), innovation (SDG 9), and global partnerships (SDG 17). With the growing importance of space exploration globally, Bangladesh can become part of the conversation through IUB's leadership.

Attachments

1. Attachment 1: Extract of the 95th meeting of BOT and the CASSA application to BOT.
2. Attachment 2: Previous application to the VC (acting) which was used for the approval of a budget of 51 lakh BDT; it has 5 appendices, where Appendix 5 is attached separately below.
3. Attachment 3: CASSA Constitution (CC) with its 7 annexures.