Memorandum of Agreement

for the

Dr. Sultana N. Nahar Endowed Prize

for the

Sultana N. Nahar prize for Distinction for Teaching Physics and Astronomy,
Sultana N. Nahar prize for Distinction in Research in Physics and Astronomy, and
Alburuj R. Rahman prize for the Best Ph.D. Dissertation in Physics/Astronomy

in the

College of Liberal Arts and Sciences
Wayne State University

Background

Dr. Sultana N. Nahar, an atomic astrophysicist at the Ohio State University, was born in Dhaka, Bangladesh. Her father, Abdur Razzaq, was a reputed lawyer and mother, Shamsun Nahar, was hard working person who built homes and rented them out. Sultana was the third of their six children. She was known as very honest, kind, and studious student from childhood. After high school, she went to Dhaka University which was the place for some very well-known scientists such as Satyn Bose, K.S. Krishnan to carry out their important research. Sultana received her B.Sc.Hons in physics in 1977 and M.Sc. in theoretical physics in 1979 from Dhaka University, standing the first position in rank in both and holding the record for the first woman to achieve them. She came to Wayne State University with graduate teaching assistantship and a Knoller Fellowship with limited knowledge of USA. She received her M.A. in Quantum Optics with Dr. I.C. Khoo in 1982 and Ph.D. in atomic theory with Dr. J.M. Wadehra in 1987 from Wayne State University. One of the computer programs she wrote during Ph.D. has been in use in India since 1990. At Wayne State, she received another Knoller Fellowship in Physics and Thomas Rumble University

Graduate Fellowship for two years, and Daniel Gustafson Memorial Award for Excellence in Teaching by a graduate student. She was in the news considerably for research and relevant activities since 2010. Women of Wayne alumni association gave her Headliner award in 2013. She was married to her classmate Dr. Lutfur Rahman which ended in divorce. They have one son named Alburuj Razzaq Rahman.

After Ph.D., she did postdoctoralship at Georgia State University for over 2 years where she studied photoionization and wrote another useful code. She moved to the Ohio State University with a fellowship from the College of Physical and Mathematical Sciences in 1990. She joined the international Opacity Project (OP) that aimed in accurate study of atomic processes in astrophysical plasmas and solve outstanding astronomical problems. Under the OP she carried out large-scale computations of some most challenging atomic systems using the facilities at the Ohio Supercomputer Center (OSC). OSC highlighted her work as ground-breaking studies number of times. Later she joined the international Iron Project (IP) aiming to solve astronomical problems with emphasis on iron ions. Iron is difficult to study because of its complexity. Nahar studied in detailed the largest number of iron ions and received unofficial title the "Iron Lady" from astronomers. One of her main studies has been on the sun.

Sultana has remained at the Ohio State University since 1990. With her colleague Anil K. Pradhan she developed a new unified method to study precisely the features of electron-ion recombination, a most common process in astrophysical plasmas. She was elected as an American Physical Society (APS) Fellow with the citation "For seminal contributions to studies of photoionization and recombination of multicharged atomic systems fundamental to atomic physics and plasma physics and pioneering calculations of remarkable complexity on astrophysically significant processes." Later she received similar certificates from Egyptian Physical Society (EPS) and Topical Society of Laser Sciences (TSLS). For her scientific contributions, TSLS honored her with its gold medal at its Silver Jubilee celebration in 2012.

Her research focuses on all dominant atomic processes in plasmas. Her another contribution is development of a new algorithm for spectroscopy which has made it possible to study large atomic systems. In 2004 her group initiated a collaboration with Radiation Oncology of Rochester University to study the interaction of x-rays with radio-sensitizing agents in radiation therapy. The therapy study needed the same x-ray physics that Sultana was using to study astrophysical phenomena, such as that of a black hole. The team of A.K. Pradhan, Yu Yan, and Sultana proposed a method named "Resonant Nano-Plasma Theranostics (RNPT)" for cancer treatment that will use much less and lower energy radiation to avoid harmful effect. A conference presentation of RNPT became a press release over a hundred media news all over the world in 2011. It was hailed as one of four prominent contributions of astronomy to

human life, along with GPS, wireless internet and laser eye-surgery, and is the theme of a chapter of book "Science Unshackled" by Rene James (John Hopkins University press 2014). RNPT work is in progress for animal experiments. Sultana has published about 155 scientific articles until 2014 and is referee of 28 journals. She is the co-author with A.K. Pradhan of the popular text book "Atomic Astrophysics and Spectroscopy" (Cambridge University press 2011) and taught the course Ohio State, Egypt and India. She has guided number of students and researchers at Ohio State and international universities. In 2012 she received "Outstanding Research Mentor" award at the Ohio State. She maintains an on-line database of her work titled NORAD-Atomic-Data at the Ohio State which is used by physicists, astronomers, engineers. For her work and role, she was awarded as "Woman Physicist of the Month" by APS in 2013.

Sultana is a promoter of research and education, particularly in Asian and Arab countries. She started Razzaq-Shamsun (named after her parents) physics research prizes for scientists in Bangladesh in 1995. She expanded her research and education program to 11 individual institutions in various parts of Bangladesh. She also has such promotional program in Aligarh Muslim University and Kashmir University in India, Cairo University and Al-Azhar University in Egypt. Her work in India initiated the proposal and then recipient of the prestigious Obama-Singh 21st Century Knowledge Initiative Award by the Ohio State University in 2013. A new curriculum for the degree of M.Ed with STEM was formulated by A.K. Pradhan, K. Irving and Sultana for the proposed work on faculty training in STEM Education and Research. Under the program four Ph.D. students from Aligarh Muslim University are being trained during 2014-2016 for world-class teaching skills and to lead advanced research in universities in India. She is an associate director of the program and a part of OSU effort for continuation of it.

She maintains a network of physicists from about 25 countries in Asia, Africa, and Middle East through which she provides information on various opportunities for research and collaboration with USA. She has brought many physicists to APS membership. She is the founder of "International Society of Muslim Women in Science" with members from 27 countries and co-founder of "International Society of Arab Women in Science". APS honored her with John Wheatley award with citation "For efforts to promote physics research and teaching through collaboration, mentoring, and philanthropy in several third-world countries, and in particular for her promotion, as both an advocate and role model, of Muslim women scientists." She received recognitions, such as, Shield of Cairo University, Medal of Dhaka University, Shield of Al-Azhar University, Monogram of Taibah University in Saudi Arabia, Our Pride award from Bangladeshi community in Ohio. She is enlisted in Pioneer Women of Bangladesh for being the first woman astrophysicist. Wayne State University gave her "Distinguished Alumni Award" in 2014.

Alburuj Razzaq Rahman was born at Ohio State University (OSU) in 1993 when his mother Dr. Sultana N. Nahar was a research fellow at OSU Astronomy Department. He started to accompany his mother, a single parent, in the evenings to OSU since 3-weeks old. At pre-school, he was noticed for his gentle and kind manner to others and picked for a model student for a class of kids with special needs. His mother gave the consent for development of kindness, but it affected Alburuj in elementary and middle schools to remain too quiet. His teachers complained for not speaking out or raise hand in class. A few teachers helped him and making many presentations since Sith Grade opened him up. He remained a topmost student until high school and received many certificates including President's award, signed by the US president, at middle school graduation. He received the "Outstanding graduating student" award at high school graduation from Columbus Technical Council which recognizes only limited number of students from all Columbus and neighboring schools. He was accepted by Cornell University and University of California, Berkeley, and went to the former one. He is expected to graduate with his bachelor degree in biology major from Cornell University in May 2015. He earned some certificates, one scholarship from Ohio State and was a finalist at University of California leadership competitions.

Research has been part of Alburuj's life. In the summer after 9th grade, Alburuj started a research project on uniform irradiation of cancer patients. Non-uniform irradiation delays healing. He obtained very good results from simulation work which was published in Journal of Undergraduate Research at the Ohio State (JUROS). With his advisor Dr. Jian Wang and other collaborators, he wrote a larger paper to be submitted after some data from patients. It stopped by sudden death of Dr. Wang from a stroke as Wang and Alburuj were the main contributors. However, the work brought the best innovation award from Columbus Tech for Alburuj. He was interviewed, was in the news published by many media. He also received the top Biology research award from Columbus Technical Council and 2nd position of Governor's award in biotechnology. He started protein research at OSU and published another paper in JUROS. He received another Governor's award in biotechnology from competing at Science Day. He continued working on research projects at Cornell and spent one summer at University of Michigan. He is working on undergraduate thesis and is hoping to write up his results for a journal paper.

Alburuj plays violin, wrote some pieces of music, received number of awards from music competitions and was a junior member of Mixed Bag band in Columbus. He loved painting and drawings. He won top prize twice from Franklin County schools and once from national drawing competitions. He designed card for Prof M.J. Seaton honored at a Harvard University workshop. He was called the "Artist" by summer camp leaders of Life Sports at OSU site whewe he participated for 7 years and designed the Thank You frame for the Athletic director. He won some recognitions from article writing competition and is a lifetime member of Columbus Folk Dancers.

Alburuj grew up with his mother and grandmother for whom he a very good companion. He traveled to all national and international conferences with them that her mother participated. Traveling has made him comfortable with scientists and to communicate people from any origin.

Donor's Intentions and Commitment

It is the intention of the donor, Dr. Sultana N. Nahar, to create the Dr. Sultana N. Nahar Endowed Prize for the Sultana N. Nahar prize for Distinction for Teaching Physics and Astronomy, the Sultana N. Nahar prize for Distinction in Research in Physics and Astronomy and the Alburuj R. Rahman prize for the Best Ph.D. Dissertation in Physics/Astronomy in the College of Liberal Arts and Sciences at Wayne State University.

Through her generosity, Dr. Nahar, in consideration of the promises and agreements of the parties set forth herein, hereby pledges $55,000 to establish the Dr. Sultana N. Nahar Endowed Prize. The gift of $55,000 will be received in March 2015.

The Dr. Sultana N. Nahar Endowed Prize is established to recognize excellence in teaching, research and scholastic achievement.

Terms and Conditions

Wayne State University accepts the above pledge and will create the Dr. Sultana N. Nahar Endowed Prize, a fund to stand in perpetuity.

1. Wayne State University agrees to establish one endowment for the purpose of administering the Dr. Sultana N. Nahar prizes.
2. This fund shall be eligible for return on the corpus under the university's long-term investment program. Expenditures will not be made directly from the corpus of the endowment fund. Distributions from the endowment fund to a beneficiary (spending) account will be made in accordance with university policy. Currently, the university is transitioning from 5 percent to a 4.5 percent annual distribution rate based on the average of the fair market value of the endowments for the prior 12 calendar quarters.
3. Wayne State University may, in its discretion, transfer the corpus of the endowment to the WSU Foundation for purposes of management and investment.
4. In accordance with university policy, endowments are assessed an annual administrative fee at the rate in effect at the time the distributions are made to the beneficiary accounts. Currently, the university is transitioning from a 0.5 percent to a 0.45 percent administrative fee on endowments, which is assessed on a quarterly basis against the average of the fair market value of the endowments for the prior 12 calendar quarters.
5. Gifts made directly to endowment beneficiary accounts, designated for immediate spending, will be assessed the administrative fee for expendable gifts at the rate in effect at the time the gifts are received. Currently, the administrative fee on expendable gifts is 2 percent.

6. The donor or others may make additional gifts to the fund's beneficiary or endowment account at any time.

7. The funds available in the endowment's beneficiary account will determine the number of these prizes to be awarded in any given year.

8. In the event that there are nonsufficient funds to award all three prizes in a given year, it is the donor's wish that the Alburuj R. Rahman prize for the Best Ph.D. Dissertation in Physics/Astronomy not be awarded, *if* withholding the $300 prize would allow the two $1,000 prizes to be made. If after withholding the $300 prize there would still be insufficient funds to award the two $1,000 prizes, the university reserves the right to use its discretion in selecting the awards that will be made under such circumstances, but keeping with the award amounts as stated herein.

9. Wayne State University reserves the right to modify or disregard any selection criteria if it is determined that the criteria are contrary to the law or existing university policy.

10. The College of Liberal Arts and Sciences will empanel a prize committee(s) to oversee the selection process. Committee members will be named at the discretion of the Chair of the Department of Physics and Astronomy and shall consist of students, the Chair of the Department of Physics and Astronomy, and the donor, Sultana N. Nahar, or her representative.

11. The Committee will select recipients of these prizes according to university policies and procedures, and in accordance with the criteria set forth in Dr. Nahar's letter dated November 11, 2014 and addressed to Professor J.M. Wadehra and Professor Ratna Naik, a copy of which is attached hereto.

12. The College of Liberal Arts and Sciences will administer all three of the above referenced prizes according to university policies and procedures. If university policies and procedures in effect for the administration of prizes and endowment funds are changed, these provisions will be automatically modified to conform to the changes.

13. If changing conditions make any of the provisions for the Dr. Sultana N. Nahar prizes no longer applicable, practical or suited to the general purposes stated herein, the university is authorized to use the fund for any other suitable purpose, related as closely as possible to the donor's original interest and intent, to provide the maximum service to the community through the advancement of higher education.

14. The university will provide the donor with an annual report of the revenues and expenditures from the fund and will encourage recipients of the prizes to communicate their appreciation to the donor.

Sultana N. Nahar prize for Distinction for Teaching Physics and Astronomy

The Sultana N. Nahar prize for Distinction for Teaching Physics and Astronomy is established to recognize the best teaching in class. The winner may not necessarily be the best physicist in the department. This prize consists of a certificate and an honorarium in the amount of $1,000.

15. It is the donor's intention that a prize of $1,000 be awarded annually.
16. In addition to the monetary prize, the recipient shall receive a certificate with the following citation: "For providing a better understanding of physics to a large group of students."
17. At no time shall Dr. Nahar's weighted vote, or that of her representative, represent more than 5 percent of the total vote.
18. Recipients are eligible for repeat prizes, but repeat prizes are not automatic. The prize committee must meet and decide each year's winner.
19. Terms and Conditions numbered 9 – 14 above, apply to this prize.

Sultana N. Nahar prize for Distinction in Research in Physics and Astronomy

The Sultana N. Nahar prize for Distinction in Research in Physics and Astronomy is established to recognize excellence in research by a professor with whom at least one student has been carrying out his/her M.Sc. or Ph.D. thesis research. This prize consists of a certificate and an honorarium in the amount of $1,000.

20. It is the donor's intention that a prize of $1,000 be awarded annually.
21. In addition to the monetary prize, the recipient shall receive a certificate with the following citation: "For making significant contributions to physics and astronomy, and training and inspiring graduate students to advanced research."
22. At no time shall Dr. Nahar's weighted vote, or that of her representative, represent more than 5 percent of the total vote.
23. Recipients are eligible for repeat prizes, but repeat prizes are not automatic. The prize committee must meet and decide each year's winner.
24. Terms and Conditions numbered 9 – 14 above, apply to this prize.

Alburuj R. Rahman prize for the Best Ph.D. Dissertation in Physics/Astronomy

The Alburuj R. Rahman prize for the Best Ph.D. Dissertation in Physics/Astronomy is established to recognize academic excellence and enrich the academic and learning environment in Physics and Astronomy. This prize consists of a certificate and an honorarium in the amount of $300.

25. It is the donor's intention that a prize of $300 be awarded annually.
26. In addition to the monetary prize, the recipient shall receive a certificate with the following citation: "For outstanding research in a Ph.D. thesis or dissertation in Physics and Astronomy."
27. The weighted criteria includes publications (published, in press, submitted), conference and other public presentations, GPA and academic, research, outreach and extra-curricular activity recognitions.
28. Terms and Conditions numbered 9 – 14 above, apply to this prize.

This agreement may not be amended except in a writing signed by the donor and the current university officials represented below.

Sultana N Nahar — 03/08/2015

Dr. Sultana N. Nahar, Donor — Date

Wayne State University

By: _____ — 2/27/15

Chacona W. Johnson — Date
Vice President for Development and Alumni Affairs
President, Wayne State University Foundation

And: R J Nork 3-3-15

Richard J. Nork, Vice President
Finance and Business Operations
Treasurer

Date

Approved as to form on behalf of Wayne State University

By: Thomas F. Cavalier 3/2/15

Thomas F. Cavalier
Assistant General Counsel

Date

THE OHIO STATE UNIVERSITY

College of Arts and Sciences

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To:

Professor J.M. Wadehra, Professor Ratna Naik
Department of Physics and Astronomy
Wayne State University
Detroit, MI 48202

November 11, 2014

Ref: Introduction of two annual faculty prizes, one for teaching and one for research, and one annual prize for Ph.D. thesis in Physics and Astronomy, Wayne State University

Dear Dr. Wadehra, Ratna,

Following discussions with both of you at Department of Physics and Astronomy, Vice President for Research Professor Stephen M. Lanier, Dean of College of Liberal Arts and Sciences Professor Wayne M. Raskind, and Assistant Director of Development and Senior Major Gift Officer Gina H. Horwitz, I am submitting the guidelines for implementation of three annual prizes, two for faculty research and teaching respectively and one for the best Ph.D. thesis, in Physics and Astronomy. I will provide $55,000 for the Sultana N. Nahar endowment fund to be set-up by Wayne State University to sponsor the prizes. The first draft with all basic conditions that we worked on was sent to both Professor Stephen Lanier and Professor Wayne Raskind who gave encouraging support for all of the prizes and agreed to participate in their respective roles for the prizes.

Each prize will consist of a certificate which will be signed by the Vice President of Research, Dean of College of Liberal Arts and Sciences, and Chair of Department of Physics and Astronomy, and an honorarium of $1000 for the faculty prizes, and $300 for the best Ph.D. thesis. Money for all prizes will come from the beneficiary account, which will belong to Department of Physics and Astronomy, of Sultana N. Nahar Endowment Fund for Physics and Astronomy. As stated by Gina Horwitz, the honorarium amount is expected to increase with time. All prize winners will be selected before the end of the academic/calendar year as decided by the Department of Physics and Astronomy. Both the Vice President of Research and the Dean of Science will be asked to participate in their respective roles and invited to the award ceremony.

Followings are the terms and conditions and distribution of points for the prizes as formulated by the sponsor, Sultana N. Nahar, in discussions with with Professor J.M. Wadehra and Professor Ratna Naik the Chair of Department of Physics and Astronomy. In case of equal points, each prize can be divided into more than one person.

Teaching and Research prizes:

The objectives of the teaching and research prizes are to recognize the best teaching in class and research in Physics and Astronomy during the past one year. These prizes will involve students choice based on their learning experience in nominating the teachers.

All faculty members, including those serving in the prize evaluation committee, are eligible to be nominated. However, during evaluation, the nominated member(s) with higher points should be replaced by another faculty member(s).

Followings are the criteria of the two annual faculty prizes.

• "Sultana N. Nahar prize for Distinction in Teaching Physics and Astronomy" - The prize will have a 90% weight from students choice. A student will make from 1 to 3 selections of faculty members on the criteria "from whom he/she has acquired maximum knowledge of the subject through in-class lectures and inspirational and intellectual interactive discussions". 5% weight will come from the Chair of Physics and Astronomy Department based on his/her judgment on teaching, such as completion of syllabus and effort for the lectures, of the nominated teachers. In the event the Chair himself or herself is nominated, the 5% weight will be decided by the prize committee overseeing the procedure. The recommendation of the sponsor, Sultana N. Nahar or her representative, will carry the rest 5 % weight to the choice. In absence of the sponsor or her representative, the 5% will be added to the students top choice.

- Certificate citation: "For outstanding teaching skill that provided a better understanding of physics to a large group of students"

- Qualifying voters are current undergraduate and graduate students with major in physics or astronomy or biophysics or subjects related to physics.

- The students will be informed about the criteria of nomination, as stated above, before voting and given the ballots with the list of faculty members (tenured, tenured track, non-tenured lecturers). The criteria should also be printed at the top of the ballots.

- As discussed the voting will be electronic or through a voting program where a student will vote through tick marks, up to 3 choices, against the list of names of teaching faculty members. The program may automatically sum up the counts or may be counted manually.

- An alternative way to make the 90% weight of the nomination is from the highest point from the end of the year evaluation by the students.

- The winner may not necessarily be the best physicist in the department.

• "Sultana N. Nahar prize for Distinction in Research in Physics and Astronomy" - This prize will be for a professor with whom at least one student has been carrying out his/her M.Sc. or Ph.D. thesis research and/or has at least one paper with a student in the author list during the past year. Research publications (published, in press, submitted combined), will carry 68% and conference/seminar presentations, organizing conferences/workshops will carry 5% weights of the nomination. General votes of the students administered for the Distinction in Teaching prize, will comprise 5% weight of the prize nomination. 12% weight of the nomination will come from the research students who will be given slips to give voting points for their advisors. A research student will give x-points out of 6 based on his/her best learning and understanding of the research topic, and x-points out of 6 on his/her intellectual and encouraging interaction with the advisor. On the slip the student will write the name of the advisor and put the total points. The recommendation of the Chair, based on the work in the research topic and student interaction, will carry 5% weight of the award nomination. The recommendation of the sponsor, Sultana N. Nahar, or her representative will carry 5% weight of the nomination. In absence of the sponsor or her representative, 5% weight will go to add to research students top choice.

- Certificate citation: "For outstanding research contributions and achievements in physics and astronomy, and training and inspiring graduate students to advanced research"

- A notice will be circulated for each faculty member to submit his/her CV to the Chair of the Department before the selection. The CV will contain the list of publications (published, in press, submitted), conference/seminar/public presentations, roles in organizing conferences or workshops in the past one year.

- Research publication weight will depend largely on i) number of publications, ii) single or multi-authors in the papers, iii) role or contribution of the faculty member in the paper, if the author list is more than one name, and to some extent on i) standard of the publishing journals and ii) any positive comments that are available from peers, such as referees or others, or media exposure of the research work.

Student prize

• "Alburuj R. Rahman prize for the Best Ph.D. Dissertation in Physics and Astronomy" - Selection of this prize will have 75% weight from publications (published, in press, submitted), 15% weight from conference and other public presentations, 5% weight from GPA, and 5% weight from other, such as, academic, outreach, extra-curricular activities.

- All Ph.D. graduating students, enrolled in their last semester for final research credits, such as 9994/9995, will be asked to submit electronic files of their i) Ph.D. thesis abstract (final or in draft), ii) Ph.D. thesis or the papers (published, in press, submitted) which are the contents of their Ph.D. thesis and iii) CV which will include the list of conference/public presentations and other activities in the office of Physics and Astronomy Department. The evaluation for this prize will be carried out along with other student awards and prizes.

• The academic committee of the Physics and Astronomy Department will form a prize evaluation committee where one member will be the graduate advisor who is informed of research activities of all graduate students and hence will provide the relevant information.

- Professor J.M. Wadehra will be the permanent member of the prize evaluation committee for both the faculty members and the student.

- The Dean of College of Arts and Sciences of Wayne State University will be the observant member of the evaluation committee for both the prizes. He/she will be informed of the top nominations and given brief descriptions of the winners for being selected for the prizes. He/she will sign the certificates and will be invited to the award ceremony.

- The Vice President of Research will be informed about the winners and given the same brief descriptions of the winners given to the Dean for his/her information. He/she will sign the certificates, and will be invited to the award ceremony.

• To recognize the honorees with appreciation all prizes will be awarded at the maximum exposure of faculty members, students, and other university members, such as, at Vaden M. Miles lecture event or other event decided by the Department of Physics and Astronomy. Their news with pictures will be published in the widely circulated university news media.

I believe that the recognitions will inspire and enhance learning excellence and academic environment, and will enrich research contributions in Department of Physics and Astronomy.

With best regards and wishes,

Sultana N. Nahar

Dr. Sultana N. Nahar