

THE NUSSOLT-REYNOLDS PRIZE

The Assembly of World Conferences on Experimental Heat Transfer, Fluid Mechanics and Thermodynamics (referred to as the Assembly hereafter) is responsible for the following charter for establishing the Nusselt-Reynolds Prize and the Prize Board, preparing the policies governing the Prize and delegating the authority to adopt and amend the Rules-of-Procedure to carry out the Charter provisions. The Assembly may terminate the Prize at any time by the consent of at least 2/3 majority of the Officers of the Assembly. The decision to award these Prizes was made at the Scientific Committee Meeting during the First World Conference in Dubrovnik, Yugoslavia in September 1988.

CHARTER

Purpose of the Prize

The Prize has been established by the Assembly to honor and commemorate outstanding contributions by Wilhelm Nusselt and Osborne Reynolds as experimentalists, researchers, educators and authors. The Nusselt-Reynolds Prize shall be bestowed at every World Conference (about three year interval) to scientists and engineers who meet the qualifications set forth in this Charter and who are selected by the Nusselt-Reynolds Prize Board as further specified in this Charter. At each World Conference, one prize may be awarded in each of the following three areas: heat transfer, fluid mechanics and thermodynamics. The prize shall be bestowed only when candidates are qualified and worthy; thus depending upon the qualified nominees, none, one, two or three prizes shall be presented at each conference.

Qualifications of the Awardee and the Basis for the Prize

The prize shall be awarded for outstanding scientific and engineering contributions and eminent achievements in the fields of heat transfer, fluid mechanics and thermodynamics through (1) experimental studies and analytical/numerical extension of the measurements, (2) development of experimental techniques, visualization techniques and/or instrumentation, and/or (3) development of design theory (that needs experimental data) and theory based experimental correlations. These contributions should yield a deeper insight into physical phenomena involved or should yield significant technological advances. In addition to research, the awardee(s) should have made outstanding contributions to the field through teaching, design or a combination of such activities. The prize is based on **achievement through publications** in any areas of heat transfer, fluid mechanics and thermodynamics, or **achievement through the application** of the science or art of heat transfer, fluid mechanics and thermodynamics.

Prize Board

The prize shall be selected and administered by a board of worldwide members from the heat transfer, fluid mechanics and thermodynamics community. The total number of members (including the Chairperson, Vice-Chairperson and Past Chairperson of the Board) shall be nine, divided approximately equally between heat transfer/thermodynamics and fluid mechanics areas, and no more than two members from one country. Officers of the Assembly are not eligible for the membership of the Prize Board. The Chairperson of the Board shall be elected by the Officers of the Assembly. The other members of this board including ViceChairperson shall be elected by the Officers of the Assembly together with the Chairperson of the Board. About one-half of the board membership shall be elected after every World Conference for two conference terms.¹ In subsequent terms, the Vice-Chairperson of the Board shall assume the Chairpersonship, and a new Vice-Chairperson shall be elected

¹ A Conference term starts the day after the last scheduled day of technical sessions at a World Conference through the next World Conference.

from the membership of the Board by the Officers of the Assembly together with the Chairperson of the Board. The Chairperson of the Board shall become Past Chairperson in the next term, and the Vice-Chairperson shall become the Chairperson. Thus, typically the officer of the Board shall have at least a three conference term duty as a Vice-Chairperson, Chairperson and the Past Chairperson to preserve continuity; the other members shall serve for two conference terms. The Officers of the Board after three/four conference terms and the members after two conference terms cannot ever be reelected on the Board. Succession of the officers shall occur one month after the completion of the latest World Conference.

Nominations and Deadlines

All nominations for the prize shall be third party nominations, i.e., self nominations shall not be accepted. Members of the professional community at large are eligible as well as members and Officers of the Assembly, Lead Scientists of any World Conference and any other members of the Scientific Committees of the World Conferences (upcoming and previous ones).

The members of the Prize Board are eligible for nomination as follows. A person who has been nominated for a prize shall not serve on the Prize Board. Should one of the designated members, other than the current Chairperson or Past Chairperson, be nominated for the prize, the Officers of the Assembly shall designate a replacement member on the Prize Board. If the current Chairperson or Past Chairperson of the Prize Board is nominated, the nomination shall be held for consideration after the nominee's term of office has ended. The Chairperson or Past Chairperson may resign from the Prize Board if that person wished to have the nomination considered before the nominee's term of office ends. The Officers of the Assembly shall appoint a replacement. If the Chairperson resigns, the Vice-Chairperson shall become Chairperson and a new Vice-Chairperson shall be appointed.

A person who nominates an individual shall furnish a completed nomination form along with five or more reference letters from professionals of at least three different countries who are familiar with the contributions of the nominee.

Nominations shall be valid for consideration by the Prize Board for two consecutive conferences after receipt of the nomination. If the current Chairperson or Past Chairperson of the Prize Board is nominated for a prize, such nomination shall be held until the nominee's term of office expires and the nominations shall then be valid for two consecutive conference terms following the expiration of the nominee's term of office.

The Prize Board may reject nominations that do not provide all requested information or may return the nomination to the person presenting the nomination for completion or additional information.

The nomination material may be updated each year by the person who presented the nomination.

Candidates may be nominated again by the same or another person after having been considered by the Prize Board for two consecutive conferences.

All nomination material shall be reviewed by both the Chairperson and ViceChairperson for completeness and legitimacy, and shall be mailed by the Chairperson to each member of the Prize Board within six weeks after the closing date of the nomination.

The Prize

The prize shall consist of a bronze plaque, an honorarium of US \$1000, an engrossed certificate, the waiver of conference registration fee, the banquet dinner for the awardee and his/her immediate family (up to three members). The Conference shall not pay any expenses to the awardee(s) for the travel, room and board for receiving the Prize.

If the awardee prefers the payment of honorarium towards travel expenses, the awardee shall so inform the Chairperson of the Prize Board in his/her acceptance letter.

The prize recipient shall be required to prepare a written state-of-the-art review paper and present a lecture at the World Conference dealing with the area of heat transfer, fluid mechanics or thermodynamics for which the prize is bestowed. This review will be published as further established b the Charter.

The prize certi7icate and the plaque shall be signed by the Chairperson of the Prize Board and by the President and Secretary General of the Assembly.

The Prize Lecture and Published Review

The written state-of-the-art review paper required as part of the prize shall be presented as a special lecture at the World Conference on Experimental Heat Transfer, Fluid Mechanics and Thermodynamics in which the recipient receives the prize. The written review required from the recipient shall be a critical and state-of-the-art review of the subject selected by the recipient. The review shall be published as part of the Proceedings of the Conference at which the prize is presented.

Selection of Recipients

The Prize Board shall select a recipient from among those candidates whose nominations meet the above requirements. Nationality, age, sex, or society membership shall not be considered when evaluating qualifications of candidates. A candidate must be living at the time of designation as recipient of the prize. A posthumous prize shall be bestowed only if the candidate signified acceptance before death.

The Prize Board may vote to forego the prize in any conference term when, upon consideration by the Board, no nominee meets the requirements of the prize.

Selection of the prize winner(s) shall normally be by a letter ballot initiated by the Chairperson, unless the Chairperson and quorum desire a meeting. Board members shall award marks to all candidates on a scale from 0-100 such that a mark of 70 is taken as the minimum required for the award of a prize. The Chairperson shall tally both the votes awarded to each candidate and his or her ranking position. Up to three prize winners may be nominated provided that

- No more than one prize is awarded in a particular area (note: Heat Transfer, Fluid Mechanics, and Heat Transfer and Fluid Mechanics all count as distinct fields as likewise does Thermodynamics and combinations involving Thermodynamics).
- At least six members of the Board rank the nominee eligible for a prize (by awarding him or her marks of 70 or above).

The areas where prize winners are to be declared shall be chosen so that, to the greatest extent possible, the candidates with the highest ranking positions are the prize recipients.

The Chairman may propose a change in the subject categorization of a candidate scoring highly (but not the highest) in the original categorization provided the published work would appear to support reconsideration under this new categorization.

The Chairman shall contact the Board members to convey the results of the ballot and to place before them a set of clear-cut choices in selecting those to be nominated for an award.

The selection and notification of the recipient shall be timely and forthwith. The Chairperson of the Prize Board shall inform the recipient of the prize. If the recipient declines the prize, another ballot shall be conducted.

Prize Board Meetings

The Chairperson may set up a meeting date and location and inform members for a meeting if a quorum can attend. A written commitment of attending a Board meeting between World Conferences is desired from the members selected on the Board. Other meetings may be called by the Chairperson or by a majority of the Board members, typically at the World Conferences. A simple majority of Board members shall constitute a quorum for conducting all business of the Board except for selection of recipients of the prize as specified above.

The Prize Funds

The Assembly shall establish the prize funds and solicit sponsors, keep custody of funds, and administer the funds as instructed and supervised by the Board. If there is an excess of prize funds, the Assembly shall establish a separate account for the prize funds.

Charter Revisions

The Prize Board can recommend or propose revisions to the Charter. Revisions to this Charter must be approved by the Officers of the Assembly. The Assembly may propose Charter revisions which must then be accepted by the Prize Board. The Prize Board shall *coordinate* and expedite all proposed revisions to the Charter.

Rules of Procedure

The attached Rules of Procedure govern details of operation of the Prize Board. The Prize Board shall adopt, revise, or amend by majority vote Rules of Procedure in consonance with this Charter.

RULES OF PROCEDURE

Nominations for the Prize

A special form shall be provided for nomination of candidates for the prize. The form shall state the purpose of the prize, request the information required for nomination, and provide the addresses and telephone numbers of both the nominee and the person presenting the nomination. A form is included with these Rules of Procedure. The form may be modified -by a majority vote of the Prize Board, but must include the information required by the Charter.

Nominations may be solicited by the Prize Board by any means the Board decides including but not limited to those from past recipients of the prize, current and past members of the Board, the Officers of the Assembly, Lead Scientists of the World Conferences, and individuals from the professional community at large. Nominations may also be solicited by publication of Calls for Nominations in professional journals. The Prize Board may also solicit nominations from appropriate professional societies in various countries.

All nominations received by the Chairperson shall be checked for completeness and legitimacy by both Chairperson and Vice-Chairperson independently. For this purpose, the Chairperson will send a copy of all nominations received to the Vice-Chairperson within two weeks.

Presentation of the Prize

The prize shall be presented at the World Conference banquet by the President of the Assembly. The Chairperson of the Prize Board or his/her designee shall introduce the prize recipient when the prize lecture is delivered.

The Chairperson of the Prize Board, at the time a recipient is selected, shall be responsible for making arrangements for the bestowal ceremony for the prize.

Selection of Recipient

Selection of the prize winner(s) shall normally be by a letter ballot initiated by the Chairperson, unless the Chairperson and quorum desire a meeting. Board members shall award marks to all candidates on a scale from 0-100 such that a mark of 70 is taken as the minimum required for the award of a prize. The Chairperson shall tally both the votes awarded to each candidate and his or her ranking position. Up to three prize winners may be nominated provided that

- No more than one prize is awarded in a particular area (note: Heat Transfer, Fluid Mechanics, and Heat Transfer and Fluid Mechanics all count as distinct fields as likewise does Thermodynamics and combinations involving Thermodynamics).
- At least six members of the Board rank the nominee eligible for a prize (by awarding him or her marks of 70 or above).

The areas where prize winners are to be declared shall be chosen so that, to the greatest extent possible, the candidates with the highest ranking positions are the prize recipients. If no candidate receives minimum required marks on the first ballot for any prize category, the Chairperson shall mail another ballot which contains the

names of only the two candidates for that field of prize who received the highest marks. The eventual recipient will be the candidate who receives the minimum set standards for the Prize and gets the highest marks.

The Chairman may propose a change in the subject categorization of a candidate scoring highly (but not the highest) in the original categorization provided the published work would appear to support reconsideration under this new categorization.

Letter ballots must be received from all Board Members. Ballots are to be returned no later than three weeks after the stamped date on the mail.

A Prize Board member who will not be present at a Board meeting may, at the member's option, designate to the Chairperson, in advance of the meeting, a ranking of all candidates for the prize. This ranking shall be used, only when a quorum is not present, for selecting the candidates to be included in a letter ballot.

Records

The records and minutes of the Prize Board shall be confidential to the members of the Board. Nominations for the prize shall also be confidential to the members of the Board. The only exception shall be that the Secretary General of the Assembly shall be sent all correspondence for the selected and rejected nominees and the minutes of the Board meeting. The Secretary General of the Assembly shall maintain all information in strict confidence.

The Chairperson shall maintain a complete set of all appropriate documents of the Board and records of all presentation ceremonies. At the expiration of his/her term, he/she shall turn over records to the new Chairperson as well as send a copy to the Secretary General of the Assembly.

Prize Brochure

A Prize Brochure shall be available to those in attendance at the Prize Presentation Ceremony. The Prize Brochure shall include a description of the prize, biographical information about Wilhelm Nusselt and Osborne Reynolds, biographical information about the recipient, a list of previous recipients, a list of the members of the Prize Board at the time the recipient was selected, and a citation prepared for the prize awardee; this citation shall be based on the citation information provided in the nomination. The Prize Brochure shall also acknowledge any financial sponsors of the prize. Information for the Prize Brochure shall be assembled by the Chairperson of the Prize Board.

Referral of Nominations

Nominations shall be referred from one prize term to another as established by the Charter. The Chairperson of the Prize Board shall notify each person (who submitted a nomination) of the disposition of the nomination after the recipients for the Conference term have been designated. This notification shall also request any updates or revisions of the nomination.

Prize Administration

The Vice-Chairperson shall be responsible for administration of the prize with approval of the Prize Board. The Vice-Chairperson shall get prepared the Prize Plaque, obtain all signatures required on the Prize Certificate, get the Prize Certificate suitably framed, get printed the Prize Brochure, and notify the Secretary General of the Assembly to keep ready the honorarium checks before the World Conference. The Vice-Chairperson shall also remind the Secretary General of the Assembly when contributions for the prizes are due from outside sponsors.

The Chairperson of the Board shall ensure that new members of the Prize Board are appointed by the Assembly as provided by the Charter and that new members receive all communications necessary to conduct the business of the Board.

The Secretary General of the Assembly shall be responsible for printing the nomination form and for providing copies to Chairperson of the Board.

Duties of the Chairperson

- Publicize the Call for Nominations; the Officers of the Assembly may assist the Chairperson for publicizing.
- Furnish the nomination material whenever requested.
- Receive all nominations.
- Send a copy of all nominations received to Vice-Chairperson within weeks for an independent check on completeness and legitimacy as well as the Chairperson shall review all nominations for completeness and legitimacy.
- If appropriate, set up a Prize Board meeting, notify the members and decide on whether or not there is a quorum.
- Preside over a meeting of the Prize Board.
- Send the letter ballots to the members of the Prize Board, receive them, tally the marks received, communicate as necessary, and decide on the prize recipients.
- May call a meeting at the World Conference.
- Notify the prize awardees and request them to prepare the state-of-the-art review paper.
- Introduce the prize recipient at the time when the prize lecture is delivered at a World Conference.
- Responsible for the bestowal ceremony of the prize, including assembling all information for the prize brochure.
- Notify senders of all unsuccessful nominees and ask them for an update on the nominee qualifications if the nominee is still eligible for the subsequent conference.
- Ensure that new members of the Prize Board are appointed in a timely manner and furnish them necessary information to conduct the business of the Prize Board.
- Keep record of all meetings of the Prize Board and records of all presentation ceremonies
- Turn over a complete set of records to the Secretary General of the Assembly upon the expiration of his/her term.

Duties of the Vice-Chairperson

- Shall earn the Chairpersonship by fulfilling the following duties and shall become the Chairperson of the Board in the subsequent term.
- Responsible for coordination of the nomination procedure. Ensure the completeness and legitimacy of all nominations received from the Chairperson and inform so to the Chairperson within three weeks of the receipt of the material.
- Responsible to tally marks for the selection of the awardee(s) at the Prize Board meeting, if held.

- Responsible for administration of the prize that includes getting made the prize plaque, obtain all necessary signatures on the prize certificate, framing of the prize certificate, printing of the prize brochure, and notify the Secretary General of the Assembly to have ready the honorarium checks in time.
- The Vice-Chairperson shall also remind the Secretary General to obtain contributions from outside sponsors in a timely manner. The Secretary General or the President of the Assembly may assist as necessary in all details of the administration of the prize.

Revisions of Rules of Procedure

These Rules of Procedure may be amended or revised by a majority vote of the members of the Prize Board at any board meeting or by mail with approval from the majority of the members.

This package has been prepared by the Officers of the Assembly on April 16, 1990, and revised on July 17, 1995.