INTERNATIONAL UNION OF RADIO SCIENCE
UNION RADIO-SCIENTIFIQUE INTERNATIONALE
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Rules for the Award of the Balthasar van der Pol and John Howard Dellinger Gold Medals

1. The Balthasar van der Pol and the John Howard Dellinger Gold Medals honour the memory of two scientists who were closely associated with URSI for many years. The awards are made normally at intervals of three years on the occasion of the General Assembly and Scientific Symposium of URSI. If the interval between two General Assemblies is either considerably greater or considerably less than three years, the Board of Officers is authorized to modify the date on which the next Medals will be awarded, the period referred to in Art. 2, and the dates referred to in Arts. 3 and 4.

2. The Medals are awarded to outstanding scientists whose achievements in any of the branches of science covered by the Commissions of URSI have been particularly valuable. No member of the URSI Board of Officers shall be eligible. The award is for career achievements of the candidate with evidence of significant contributions within the most recent six-year period.

3. The names of not more than two candidates may be submitted by any Member Committee of URSI, URSI Commission Chair or Vice-Chair, or former laureate of any URSI award. The names of the candidates must be received by the Secretary General of URSI not later than 15 August of the year preceding that of the General Assembly and Scientific Symposium at which the award is to be made.

4. The name of each candidate must be accompanied by a nomination form (supplied by the URSI Secretary General) providing information on, inter alia:

   (a) a general summary of the candidate's career and scientific activities;
   (b) a review of the candidate's recent achievements, including references to the most important papers of which the candidate is the sole or a joint author published during the six-year period referred to in Article 2;
   (c) an outline of the reasons for the nomination of the candidate.

5. As soon as possible after 15 August, copies of the nomination forms referred to in Article 4 shall be sent to the Awards Advisory Panel by the Secretary General. The members of the Awards Advisory Panel shall be determined by the President of URSI, in consultation with the Board of Officers. The Panel is authorized, when necessary, to consult non-members regarding the merits of the candidates before submitting its own considered views to the Board of Officers not later than 1 March of the year of the General Assembly and Scientific Symposium.

6. The Board of Officers has full authority to select the candidates to whom the awards will be made. In doing so it will take into account the information provided by the proposers of the candidates and also the views expressed by the Awards Advisory Panel. The Board of Officers will bear in mind that it is desirable to make the awards to candidates working in different branches of radio science, and that the J.H. Dellinger Gold Medal should be awarded preferably for work in the field of radio wave propagation.

7. The Board of Officers has full authority to withhold one or both awards if, in the opinion of the members, there is an insufficient number of qualified candidates.

Laureates of the Balthasar van der Pol Gold Medal

1963: Sir Martin RYLE (UK): Application of the phase switching and aperture synthesis techniques to antennas for radio astronomy.

1966: Prof. W.E. Gordon (USA): Development of the incoherent scatter technique for ionospheric studies.

1969: Dr. J.P. WILD (Australia): Radio astronomy, including completion of a notable high-resolution radio-heliograph.

1972: Dr. B.D. JOSEPHSON (UK): Electronic effects in superconductors.

1975: Prof. L.B. FELSEN (USA): Application of ray-optical methods to studies of the propagation and diffraction of electromagnetic waves.

1978: Dr. J.R. WAIT (USA): Work on propagation of electromagnetic waves in the Earth's crust, and application of results.

1981: Prof. D.S. JONES (UK): Work on electromagnetic theory and, in particular, on the development of a number of analytical approaches.

1984: Prof. W.G. FARNELL (Canada): Work in physical electronics, in particular on microwave lenses, spin phonon interactions in solids, microwave acoustics, and acoustic microscopy.

1987: Dr. T. HAGFORS (Norway): Contributions to radar engineering and the theory and experimental development of the incoherent scatter techniques.

1990: Prof. A.A. Oliner (USA): Contributions to theory of guided waves, especially leaky waves, and novel radiating structures.

1993: Prof. T.B.A. SENIOR (USA): For theoretical contributions to diffraction and scattering of electromagnetic waves, with particular reference to the simulation of material effects in scattering.

1996: Prof. R. HARRINGTON (USA): For contributions to electromagnetics and the development of the method of moments

1999: Prof. S. SHAMAI (Israel): For contributions to the basic understanding of the potentials for and the limitations to information transfer through various communication channel models.

2002: Prof. A.T. DE HOOP (the Netherlands): For fundamental contributions to the theory of radiation and scattering of waves.

2005: Prof. I.V.I. LINDELL (Finland): For the development of new methods and solutions in electromagnetic field theory and for exceptional didactic skills

2008: Prof. W.J. WELCH (USA): Pioneer of millimetre wavelength interferometry to investigate astronomical objects ranging from solar system planets to galaxies at the edge of the Universe with spectral and angular resolution

2011: Dr. Ehud HEYMAN (Israel): For developing mathematical tools to analyse the generation, propagation and scattering of beam-shaped electromagnetic fields, and their engineering applications.

2014: Dr. Nader Engheta (USA): For groundbreaking contributions and innovations in electromagnetic theory and applications of composite materials, metamaterials and nanoscale optics, bio-inspired imaging and sensing, and material-based optical nanocircuitry.

Laureates of the John Howard Dellinger Medal

1966: Drs. J.H. CHAPMAN (Canada): Radio wave propagation and the Alouette I topside ionosphere sounder.

1969: Prof. H.M. BARLOW (UK): Development of waveguides ; the characteristics of surface waves.

1972: Prof. A. HEWISH (UK): Advances in radio astronomy.

1975: Prof. N.M. BRICE (USA): Theory of the Earth's plasmapause and theoretical investigations of the physics of Jupiter's magnetosphere.

1978: Prof. D.A. GURNETT (USA): Investigations relating to electromagnetic and electrostatic wave propagation in the Earth's plasma environment.

1981: Dr. J. FEJER (Germany): Work on ionospheric modifications, parametric instabilities, ionospheric irregularities and incoherent scatter.

1984: Mrs. I. DE PATER (the Netherlands): Work on noise of planetary origin, the magnetosphere of Jupiter, and shock waves in the magnetosphere of the Earth.

1987: Dr. R. GENDRIN (France): Study of waves of natural origin propagating in the surroundings of the Earth, and their influence on the behaviour of the magnetosphere.

1990: Dr. G. SWARUP (India): Contribution to radioastronomy and cosmology, both in observational research and in conceiving and building radio telescopes.

1993: Dr. P. STUBBE (Germany): For the conception, construction, and operation of a high frequency ionospheric modification facility in the auroral zone and for the theoretical advancement of the understanding of the associated plasma process.

1996: Prof. T. OGUCHI (Japan): For theoretical work on the polarization effects of non-spherical raindrops and the multiple scattering effects of hydrometeors.

1999: Dr. A. ISHIMARU (USA): For contributions to the theories and applications of wave propagation and scattering in random media a backscattering enhancement.

2002: Prof. D.L. CARPENTER (USA): For his discovery of the plasmapause, for pioneering studies of the plasmasphere structure and dynamics and for development and use of whistler-mode waves as diagnostic probes of the magnetosphere.

2005: Prof. J.B. ANDERSEN (Denmark): For significant contributions to the theory of antenna characteristics and scattering, wave propagation over inhomogeneous areas in mobile communication, and interaction between electromagnetic fields and biological tissue.

2008: Prof. A.E.E. ROGERS (USA): For his outstanding contributions to instrumentation in radio astronomy and its use to make fundamental discoveries about interstellar masers, superluminal expansion of quasars, deuterium abundance in the galaxy, and plate tectonics.

2011: Dr. D.H. STAELIN (USA): For seminal contributions to the passive microwave remote sensing of planetary atmospheres and the development of remote sensing of the atmosphere and environment of the Earth from space.

2014: Dr. J.-P. G. Berenger (France): For seminal work on the development of breakthrough absorbing boundary conditions for computational electromagnetics in radiosciences.

Rules for the Award of the Appleton Prize

1. The Appleton Prize is awarded by the URSI Board of Officers and honours the memory of Sir Edward Appleton, F.R.S., President of URSI from 1934 to 1952. The Prize of EUR 300 is awarded normally at intervals of three years on the occasion of the General Assembly and Scientific Symposium of URSI. If the interval between two General Assemblies is either considerably greater or considerably less than three years, the Board shall modify the date on which the next award will be made, and the dates referred to in Articles 3, 5 and 6 below.

2. The Appleton Prize is awarded for outstanding contributions to studies in ionospheric physics. The award is for career achievements of the candidate with evidence of significant contributions within the most recent six-year period. No member of the URSI Board if Officers shall be eligible.

3. Candidates may be nominated by any Member Committee of URSI, URSI Commission Chair or Vice-Chair or former laureate of any URSI award including the Appleton Prize, but not more than one candidate may be nominated by any one Committee or individual. The names of the candidates must be received by the Secretary General of URSI not later than 15 August of the year preceding that of the General Assembly and Scientific Symposium at which the award is to be made.

4. The name of each candidate must be accompanied by a nomination form (supplied by the URSI Secretary General) providing information on, inter alia:

   (a) a general summary of the candidate's career and scientific activities;
   (b) a review of the candidate's recent achievements, including references to the most important papers of which the candidate is the sole or a joint author published during the six-year period referred to in Article 2;
   (c) an outline of the reasons for the nomination of the candidate.

5. As soon as possible after 15 August, copies of the nomination forms referred to in Article 4 shall be sent by the Secretary General to the Awards Advisory Panel, the members of which shall be determined by the President of URSI in consultation with the Board of Officers. The Panel is authorized to seek additional advice from outside its membership, regarding the merits of the candidates, before submitting its own considered views to the Board of Officers not later than 1 March of the year of the General Assembly and Scientific Symposium.

6. After considering the views submitted by the Awards Advisory Panel, the Board of Officers makes a final decision.

Laureates of the Appleton Prize

1969: Prof. W.I. AXFORD (N.Z.): Ionospheric and magnetospheric physics.

1972: Prof. R.A. HELLIWELL (USA): Radio wave propagation in the magnetosphere.

1975: Dr. J.V. EVANS (USA): Ionospheric physics, including application of the incoherent scatter technique.

1978: Prof. P.M. BANKS (USA): Theoretical and observational studies of the plasma flow between the ionosphere and the magnetosphere.

1981: Dr. H. RISHBETH (UK): Contributions to studies of the dynamics and structure of the ionosphere F region.

1984: Prof. K.D. COLE (Australia): Contributions to the understanding of the basic processes taking place in the magnetosphere and the ionosphere.

1987: Dr. S. KATO (Japan): contributions to the study of the ionosphere and the middle atmosphere, and in particular for the development of a highly sophisticated radar to observe the atmosphere.

1990: Dr. A.V. GUREVICH (Russia): contributions to the understanding of the non-linear properties of the ionosphere, particularly with respect to the interaction with high-power radiowaves.

1993: Prof. T.B. JONES (UK): For major contributions, individually and in scientific leadership, to the study of ionospheric physics, using radio and radar techniques.

1996: Dr. D.T. FARLEY (USA): For contributions to the development of the incoherent scatter radar technique and to radar studies of ionospheric instabilities.

1999: Dr. R.F. WOODMAN (Peru): For major contributions and leadership in radar studies of the ionosphere and neutral atmosphere.

2002: Dr. R.A. GREENWALD (USA): For conceiving, designing, developing and deploying two ground-breaking measurement techniques that have provided unparalleled spatial and temporal measurements of the ionosphere, and for inspirational international leadership.

2005: Dr. D. MASSONNET (France): For his outstanding work on radar imaging and satellite radar interferometry, a technique combining high frequencies, propagation and digital signal processing.

2008: Prof. U.S. INAN (USA): For fundamental contributions to understanding of whistler-mode wave-particle interaction in near-Earth space and the electrodynamic coupling between lightning discharges and the upper atmosphere

2011: Prof. B.W. REINISCH (USA): For revolutionizing radio sounding from ground and space with development of the Digisonde and the IMAGE/RPI satellite instrument, both essential data providers for space weather monitoring and ionospheric modeling.

2014: Dr. R.F. BENSON (USA): For fundamental contributions to knowledge of the interactions of space borne radio sounders with the Earth's plasma environment and to the use of sounders as diagnostic probes of that environment.

Rules for the Award of the Booker Gold Medal

1. The Booker Gold Medal honours the memory of Professor Henry G. Booker who served as URSI Vice President, 1969-1975, and Honorary President until his death in 1988. The award is made normally at intervals of three years, on the occasion of the General Assembly and Scientific Symposium of URSI. If the interval between two General Assemblies is either considerably greater or considerably less than three years, the Board of Officers is authorized to modify the date on which the next Medal will be awarded, the period referred to in Article 2, and the dates referred to in Articles 3 and 5.

2. The Medal is awarded for outstanding contributions to telecommunications or a related discipline of direct interest to URSI. The award is for career achievements of the candidate with evidence of significant contributions within the most recent six-year period. No member of the URSI Board of Officers shall be eligible.

3. Candidates may be nominated by any Member Committee or URSI, URSI Commission Chair or Vice-Chair or former laureate of any URSI award, but not more than one candidate may be nominated by any one Committee or individual. The names of the candidates must be received by the Secretary General of URSI not later than 15 August of the year preceding that of the General Assembly and Scientific Symposium at which the award is to be made.

4. The name of each candidate must be accompanied by a nomination form (supplied by the URSI Secretary General) providing information on, inter alia:

   (a) a general summary of the candidate's career and scientific activities;
   (b) a review of the candidate's recent achievements, including references to the most important papers of which the candidate is the sole or a joint author published during the six-year referred to in Article 2;
   (c) an outline of the reasons for the nomination of the candidate.

5. As soon as possible after 15 August, copies of the nomination forms referred to in Article 4 shall be sent to the Awards Advisory Panel by the Secretary General. The members of the Awards Advisory Panel shall be determined by the President of URSI in consultation with the Board of Officers. The Panel is authorized, when necessary, to consult non-members regarding the merits of the candidates, before submitting its own considered view to the Board of Officers not later than 1 March of the year of the General Assembly and Scientific Symposium.

6. The Board of Officers has full authority to select the candidate to whom the Award will be made. In doing so it will take into account the information provided by the proposers of the candidate, and also the views expressed by the Awards Advisory Panel.

7. The Board of Officers has full authority to withhold the award if, in the opinion of the members, there is not a qualified candidate.

Laureates of the Booker Gold Medal

2002: Prof. S. HAYKIN (Canada): For significant and fundamental contributions to adaptive signal processing and neural networks, and their applications to radar and digital communications, the characterizations of which are dominated by nonstationary physical phenomena.

2005: Prof. Y. RAHMAT-SAMII (USA): For fundamental contributions to reflector antenna design and practice, near-field measurements and diagnostic techniques, handheld antennas and human interactions, genetic algorithms in electromagnetics, and the spectral theory of diffraction.

2008: Prof. H. MATSUMOTO (Japan): For his outstanding contributions to the understanding of nonlinear plasma wave processes, promotion of computer simulations in space plasma physics, and international leadership in plasma wave research.

2011: Prof. I.C. DAUBECHIES (USA): For her outstanding contributions to mathematics, and in particular to wavelet theory, and for the remarkable impact of her work in a wide range of applied science disciplines.

2014: Dr. Harold Vincent POOR (USA): For outstanding contributions to the science and technology of communications and signal processing

Rules for the Award of the Issac Koga Gold Medal

1. The Issac Koga Gold Medal honours the memory of a scientist who was closely associated with URSI for many years. The award is made normally at intervals of three years, on the occasion of the General Assembly and Scientific Symposium of URSI. If the interval between two General Assemblies is either considerably greater or considerably less than three years, the Board of Officers is authorized to modify the date on which the next Medal will be awarded, the period referred to in Article 2, and the dates referred to in Articles 3 and 5.

2. The Medal is awarded to a Young Scientist, of age not more than 35 on 30 September of the year preceding the General Assembly and Scientific Symposium of URSI, who has made an outstanding contribution to any of the branches of science covered by the Commissions of URSI. The award is for career achievements of the candidate with evidence of significant contributions within the most recent six-year period. The Medal will be presented at the General Assembly and Scientific Symposium.

3. The name of not more than one candidate may be submitted by any Member Committee of URSI, URSI Commission Chair or Vice-Chair or former laureate of any URSI Award. The names of the candidates must be received by the Secretary General of URSI not later than 15 August of the year preceding that of the URSI General Assembly and Scientific Symposium.

4. The name of each candidate must be accompanied by a nomination form (supplied by the URSI Secretary General) providing information on, inter alia:

   (a) a general summary of the candidate's career and scientific activities;
   (b) a review of the candidate's recent achievements, including references to the most important papers of which the candidate is the sole or a joint author published during the six-year referred to in Article 2;
   (c) an outline of the reasons for the nomination of the candidate.

5. As soon as possible after 15 August, copies of the nomination forms referred to in Article 4 shall be sent to the Awards Advisory Panel by the Secretary General. The members of the Awards Advisory Panel shall be determined by the President of URSI in consultation with the Board of Officers. The Panel is authorized, when necessary, to consult non-members regarding the merits of the candidates, before submitting its own considered views to the Board of Officers not later than 1 March of the year of the General Assembly and Scientific Symposium.

6. The Board of Officers has full authority to select the candidate to whom the Award will be made. In doing so it will take into account the information provided by the proposers of the candidate, and also the views expressed by the Awards Advisory Panel.

7. The Board of Officers has full authority to withhold the award if, in the opinion of the members, there is not a qualified candidate.

Laureates of the Issac Koga Gold Medal

1984: Dr. M. OHTSU (Japan): Work on precise optical measurements, gas and semi-conductor lasers, including the frequency stabilization of these components.

1987: Prof. D.M. POZAR (USA): Contributions to the analytical, numerical and experimental study of printed antennas and phased arrays, and related problems in applied electromagnetics.

1990: Dr. M. LOCKWOOD (UK): Study of non-thermal ionospheric plasma and ionospheric convection.

1993: Prof. G. REBEIZ (USA): For contributions to the advancement of sub-millimetre wave antenna science and technology.

1996: Prof. Z. POPOVIC (USA): For contributions to the field of active microwave circuits, in particular, the original demonstration of the planar grid oscillator, as well as continuing efforts with quasi optical amplifiers and active antennas.

1999: Prof. E. MICHIELSSEN (USA): For contributions to computational electromagnetics, in particular the development of fast frequency and time domain integral equation analysis techniques and nature-driven synthesis methods.

2002: Prof. F. OLYSLAGER (Belgium): In recognition of his work on theoretical and numerical electromagnetics (in particular in the field of boundary integral equations, waveguides and bianisotropic media).

2005: Prof. S.C. HAGNESS (USA): For contributions to the development of enhanced finite-difference time-domain methods in computational electromagnetics, and ultrawideband microwave imaging techniques for early breast cancer detection.

2008: Prof. D.F. SIEVENPIPER (USA): For contributions to the development of artificial impedance surfaces and conformal antennas.

2011: Dr. A. ALÙ (USA): For contributions to the theory and application of electromagnetic metamaterials, in particular the conception of plasmonic-based cloaking, optical nanocircuits, and anomalous propagation and radiation in metamaterials.

2014: Dr. F.P. Andriulli (France): For contributions to computational electromagnetics, specifically the development of preconditioned and stable integral equation solvers.

Rules for the Award of the Santimay Basu Prize

1. The Santimay Basu Prize honours the memory of a scientist who was closely associated with URSI for many years. The award is made normally at intervals of three years, on the occasion of the General Assembly and Scientific Symposium of URSI. If the interval between two General Assemblies is either considerably greater or considerably less than three years, the Board of Officers is authorized to modify the date on which the next Prize will be awarded, the period referred to in Article 2, and the dates referred to in Articles 3 and 5.

2. The Prize is awarded to a young scientist, not more than 35 years old on 30 September of the year preceding the General Assembly and Scientific Symposium of URSI, who has made an outstanding contribution to research that furthers the understanding of radio-wave propagation in random media and its application for the benefit of society. The award will take into account the excellence of the research, the merit of the candidate in achieving his or her results, and the efforts required to accomplish the research.

   The Prize will be presented at the General Assembly and Scientific Symposium

3. The name of not more than one candidate may be submitted by any Member Committee of URSI, URSI Commission Chair or Vice-Chair or former laureate of any URSI Award. The names of the candidates must be received by the Secretary General of URSI not later than 15 August of the year preceding that of the URSI General Assembly and Scientific Symposium.

4. The name of each candidate must be accompanied by a nomination form (supplied by the URSI Secretary General) providing information on, inter alia:

   (a) a general summary of the candidate's career and scientific activities;
   (b) a review of the candidate's recent achievements, including references to the most important papers of which the candidate is the sole or a joint author published during the six-year referred to in Article 2;
   (c) an outline of the reasons for the nomination of the candidate.

5. As soon as possible after 31 October, copies of the nomination forms referred to in Article 4 shall be sent to the Awards Advisory Panel by the Secretary General. The members of the Awards Advisory Panel shall be determined by the President of URSI in consultation with the Board of Officers. The Panel is authorized, when necessary, to consult non-members regarding the merits of the candidates, before submitting its own considered views to the Board of Officers not later than 1 March of the year of the General Assembly and Scientific Symposium.

6. The Board of Officers has full authority to select the candidate to whom the Award will be made. In doing so it will take into account the information provided by the proposers of the candidate, and also the views expressed by the Awards Advisory Panel.

7. The Board of Officers has full authority to withhold the award if, in the opinion of the members, there is not a qualified candidate.

Laureates of the Santimay Basu Prize

2014: Dr. M.B. Cohen (USA): For contribution to ELF/VLF radio wave instrumentation, propagation, and generation, in the ionosphere and magnetosphere, and for initiating and fostering an international network of young scientists in developing countries.

Rules for the Award of the Karl Rawer Gold Medal

1. The Rawer Gold Medal honours the work and life of Professor Karl Rawer who was father of the International Reference Ionosphere (IRI) chairing the COSPAR/URSI Inter-Union IRI Working Group from 1968 to 1976 and the Vice-Chair and Chair of what is now Commission G between 1966 and 1972. The award is normally made at intervals of three years, on the occasion of the General Assembly and Scientific Symposium of URSI. If the interval between two General Assemblies is either considerably greater or considerably less than three years, the URSI Board of Officers is authorized to modify the date on which the next Medal will be awarded.

2a. The Medal is awarded for outstanding contributions in any discipline of direct interest to URSI.
2b. The award is for career achievements of the candidate. The successful candidate will likely be over 55 years of age.
2c. Preference will be given to candidates who have worked for and within URSI and have fostered international cooperation across political borders and cultures.
2d. No member of the URSI Board of Officers shall be eligible.

The Prize will be presented at the General Assembly and Scientific Symposium

3. Candidates may be nominated by any Member Committee of URSI, URSI Commission Chair or Vice-Chair or former laureate of any URSI award, but not more than one candidate may be nominated by any one Committee or individual. The Secretary General of URSI must receive the names of the candidates on or before 15 August of the year preceding the year of the General Assembly and Scientific Symposium at which the award is to be made, however, the Board may vary this deadline at its discretion.

4. The name of each candidate must be accompanied by a nomination form (supplied by the URSI Secretary General) providing information on, inter alia:

   (a) a general summary of the candidate's career and scientific activities;
   (b) a review of the candidate's recent achievements, including references to the most important papers of which the candidate is the sole or a joint author;
   (c) an outline of the reasons for the nomination of the candidate.

5. As soon as possible after the deadline, copies of the nomination forms referred to in Article 4 shall be sent to the Awards Advisory Panel by the Secretary General. The members of the Awards Advisory Panel shall be determined by the President of URSI in consultation with the Board of Officers. The Panel is authorized, when necessary, to consult non-members regarding the merits of the candidates, before submitting its own considered view to the Board of Officers not later than 1 March of the year of the General Assembly and Scientific Symposium.

6. The Board of Officers has full authority to select the candidate to whom the Award will be made. In doing so it will take into account the information provided by the proposers of the candidate, and also the views expressed by the Awards Advisory Panel.

7. The Board of Officers has full authority to withhold the award if, in the opinion of the members, there is no qualified candidate.

Laureates of the Karl Rawer Gold Medal

Established in 2017