

California Institute of Technology

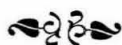


COMMENCEMENT
EXERCISES

Friday afternoon
June eighth, nineteen fifty-one
at four-thirty o'clock

PROGRAM

*Presiding: James R. Page, LL. D.,
Chairman of the Board of Trustees*



ORGAN PRELUDE AND PROCESSIONAL

INVOCATION

*The Right Reverend Francis Eric Bloy, D. D., S. T. D.
Bishop of Los Angeles*

COMMENCEMENT ADDRESS

*The Honorable Thomas K. Finletter, A. B., LL. B., LL. D.
Secretary of the Air Force*

CONFERRING OF DEGREES

*Lee A. DuBridge, Ph. D., Sc. D., LL.D.
President of the California Institute of Technology*

PRESENTATION OF CANDIDATES FOR DEGREES

For the degree of Bachelor of Science, by

Paul Conant Eaton, A. M.,

Associate Dean for Upper Classmen

For the degree of Master of Science in Science, by

William R. Smythe, Ph. D.,

Chairman of the Committee on the Course in Science

For the degree of Master of Science in Engineering, by

William W. Michael, B. S.,

Chairman of the Committee on the Course in Engineering

For the engineer's degree, by

William N. Lacey, Ph. D.,

Dean of Graduate Studies

For the degree of Doctor of Philosophy, by

Dean Lacey

CHARGE TO THE GRADUATING CLASS AND ANNOUNCEMENTS

President DuBridge

BENEDICTION

Bishop Bloy

*(The audience is requested to remain seated after the Benediction
until the end of the Recessional march)*

RECESSIONAL

James H. Shearer, A. R. C. M., A. R. C. O., *Organist*

Academic Procession

CANDIDATES FOR THE DEGREE OF BACHELOR
OF SCIENCE

CANDIDATES FOR THE DEGREE OF
MASTER OF SCIENCE IN SCIENCE

CANDIDATES FOR THE DEGREE OF
MASTER OF SCIENCE IN ENGINEERING

CANDIDATES FOR THE ENGINEER'S DEGREE

CANDIDATES FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

THE INSTITUTE FACULTY

CHAIRMEN OF DIVISIONS AND
DIRECTORS OF LABORATORIES

THE INSTITUTE TRUSTEES

REPRESENTATIVES OF THE
UNITED STATES AIR FORCE

THE COMMENCEMENT SPEAKERS

Candidates for Degrees

BACHELOR OF SCIENCE IN SCIENCE

George Ogden Abell	Hiroshi Kamei
Robert Garber Adler	William A. Kelley, Jr.
Paul Lincoln Armstrong, Jr.	Thomas William Layton*
Leo L. Baggerly†	Carroll Raymond Lindholm
Mitchell Bain	Robert William Madden
Charles Johnson Bates	Anthony Joseph Malanoski†
Robert Edward Bible	David T. Manning*
Barrie Hill Bieler	Harold F. Martin
Joseph Ralph Bookee	Hugh Jack Martin, Jr.
Richard George Brewer	Peter Vroman Mason*†
Thorne Jefferson Butler†	Edwin Arthur Matzner
Ronald Taylor Caldwell	George Merkel
Douglas E. A. Calley	Ulrich Merten*†
Robert Eugene Cobb†	John Fielding Moss, Jr.
Robert Frederick Connelly	Howard Frederick Mower
Edward Bailey Crichton†	Duane Charles Neverman†
Walter Francis Davison*	Charles Theodore Paulson
James Quincy Denton	Dallas Lynn Peck*†
William A. Drake	Walter Frederick Pfeiffer
David L. Durham	Cornelius John Pings, Jr.
Lawrence Dean Dyer	Rex Bernard Ragon
Ernest Dzenolet	Harry Porter Rappaport*
Walter Gibson Edwards	Sergio E. Rodriguez Gelpi
Fred Henry Eisen*	Winston Walker Royce
John Kendall Elder	William Frank Sampson
David George Elliott	Kazuhiko Sato*
James Adair Enslow	George Marshall Sawyer
Thomas R. Fahy	Gene Gibson Shakespeare
Rudolph Jonathan Goerke, III†	Richard S. Sharp
Raymond Henry Greutert	Raymond Andrew Sjodin
Paul Francis Helfrey*	Richard Kelly Smyth
Carl-Nils Hildabrand	Charles McHenry Steese, Jr.*†
Carl Alvin Hirsch	Kent Stratton†
John Lincoln Holmes*	Sanford Shaffer Sweet*
Frank Luis Hooper*	Richard Bartlett Taylor*
James Arthur Ibers*	Alfred Walter Thiele
Roland Warren Johnson	Robert McNally Walp
John Beverley Johnston*	John Harris Walter*
Taylor Blanding Joyner	Leslie Kent Wanlass
Reuben Kachadoorian	William Merrill Whitney*†

*Graduated with honor in accordance with a vote of the Faculty.

†Awarded the Honor Key by the Associated Students, CIT, for participation in student activities.

BACHELOR OF SCIENCE IN ENGINEERING

Frederick George Baily	Dan Brown LeMay
Michael Abram Basin*	Howard Bradbury Lewis, Jr.
Wayne Metcalf Beebe	Richard Miles Libbey*†
Harry Alexander Begg	James T. Luscombe
Richard Craig Brandt Bemis	Joseph Laurance Mangin
Kenneth Riggs Berg	James Howard McQuiston
Roland Alexander Berner	John William Morrison
John W. Bjerklie*	Robert Ross Munro
Dean Mercer Blanchard	Jan Arne Narud
Emil Vincent Boblett	Ritchey Owsley Newman, Jr.
Ray Deverle Bowerman	Richard K. Nuno
Robert Gene Boyer	Robert Francis O'Connell*
Frank Charles Bumb, Jr.*	Richard Stephen Pardee
Rodney Sturgis Bunker	Victor David Porizky
Kwok-Ying Chong*	Peter Price
Bert Hyland Clark	Edwin Eugene Pyatt
Thomas Weir Connolly	David Shephard Rathje
Robert Eugene Covey	Uri Retter
Arthur Robert Cuse†	Don Walter Schmid†
Dean Cauffield Daily, II†	Alfred Walter Sereno
Robert Paul Day	Paul Enock Skoglund
Robert Woodman DeGrasse	Robert Elphin Smith
Joseph Myers Denney	William Rodman Smythe
John Wesley Dyer	Lawrence Vincent Sokol
William Eugene Eilau	Louis George Stallkamp
John Grant Elliott	Edward Abraham Stern*
John Raymond Feet†	Joseph Edward Sunderlin
Oliver Henry Gardner†	Jack Murry Sweetman
Franklin Ralph Goodman*	Robert Bruce Team, Jr.
John Valien Hallstrom	Björn Alexander Thorstensen
Phillip Carl Halverson	George Henry Trilling*
Bruce Burgess Hedrick	Albert Eugene Van Hise
Earl Charles Hefner†	Ludwig Rupert Vreugde
William H. Henley	Robert Lee Waid
Bradford Carr Houser†	Elmer Francis Ward
Henry Ito	George Berkshire Welch
Albert Smith Jackson	Arthur E. Wennstrom*
John Franklin Kinkel	Frederick Eugene Wood, Jr.†
Marshall L. Klarfeld	William Vale Wright, Jr.*
Terry Winthrop Koerner	

*Graduated with honor in accordance with a vote of the Faculty.

†Awarded the Honor Key by the Associated Students, CIT, for participation in student activities.

MASTER OF SCIENCE IN SCIENCE

Biology

Glenn Albert Fischer, B.A. *University of Colorado*, 1949.

Chemical Engineering

John McMillan Haygood, B.S., *University of Illinois*, 1947.

Scott Lynn, B.S., *California Institute of Technology*, 1950.

David Brice Wilford, B.S., *California Institute of Technology*, 1948.

Chemistry

Richard Pierson Buck, B.S., *California Institute of Technology*, 1950.

Walter Van Norman Goeddell, B.A., *San Diego State College*, 1949.

Francis J. Petrcek, B.S., *St. John's University*, 1949.

Geological Sciences

Manuel Nathan Bass, B.S., *California Institute of Technology*, 1949.

Richard Bradford Campbell, B.A. Sc., *University of British Columbia*, 1948.

Royal Stuart Foote, A.B., *San Diego State College*, 1949.

Rodney Thirsk Phipps, B.Sc., *University of Alberta*, 1947.

William Brian Roberts, E.M., *Colorado School of Mines*, 1943.

George Irving Smith, A.B., *Colby College*, 1949.

Geophysics

Clarence Roderick Allen, B.A., *Reed College*, 1949.

Wilfred Cloyd Mosier, *Geophysical Engineer, Colorado School of Mines*, 1950.

Allen Minard Rugg, Jr., *Geological Engineer, Colorado School of Mines*, 1941.

Pierre St. Amand, B.S., *University of Alaska*, 1948.

Mathematics

Donald Eugene Sanderson, B.A., *Cornell College*, 1949.

Meteorology

Riddell Lee Hawk, B.S., *Southern Methodist University*, 1947; B.S., *University of Texas*, 1949.

Physics

Graydon D. Bell, B.S., *University of Kentucky*, 1949.

Eli Botkin, B.S., *New York University*, 1949.

Woldemar Franz v. Jaskowsky, *University of Göttingen*.

Robert James Mackin, Jr., B.E., *Yale University*, 1949.

Robert Ernest Odening, Cmdr., U.S.N., M.S., *Cornell University*, 1944.

H. Kendall Reynolds, B.A., *Denison University*, 1949.

Walter LeRoy Starr, B.S., *University of Southern California*, 1950.

MASTER OF SCIENCE IN ENGINEERING

Aeronautics

- David Benun, *B.S., Parks Air College, 1942.*
Harry Thomas Brackett, *B.S., University of Maryland, 1942.*
George Stuart Campbell, *B.S., Rensselaer Polytechnic Institute, 1947.*
Cecil Vance Carter, *B.S., University of Michigan, 1950.*
Bain Dayman, Jr., *B.S., California Institute of Technology, 1950.*
Aram Ohannes Dervishyan, *Associate Fellowship of the Aeronautical Society, 1944.*
Robert Pierce Frye, *B.S., Louisiana State University, 1950.*
Edward C. Gahl, *B.S., Texas Technological College, 1950.*
Howard Clarke Goodell, Lt. Col., U.S.A.F., *B.S., United States Military Academy, 1941.*
Frederic William Hartwig, Lt., U.S.A.F., *B.S., United States Military Academy, 1945.*
Fred Gene Hayos, Jr., *B.A.E., New York University, 1950.*
Robert Samuel Kraemer, *B.S., University of Notre Dame, 1950.*
Arthur Burlingham Leak, *B.A.E., Rensselaer Polytechnic Institute, 1950.*
John Cotton Marshall, *B.S., California Institute of Technology, 1949.*
Howard Martin McMahon, *B.M.E., University of Santa Clara, 1950.*
Frederick Edward Mickey, *B.S., University of Michigan, 1947.*
Peter Frederick Orchard, *B.Sc., Bristol University, 1950.*
John Monroe Palmer, Jr., *B.S., Louisiana State University, 1950.*
Nigel Pridmore-Brown, *B.A., Principia College, 1950.*
Kendrick Radey, *B.S., Texas University, 1947.*
Frederick Theodore Rall, Jr., *B.S., Massachusetts Institute of Technology, 1950.*
Martin Samuel Robinson, *B.S., California Institute of Technology, 1948.*
Manuel Antonio Sánchez, *B.A.E., University of Detroit, 1950.*
Howard Skavdahl, *B.S., University of Colorado, 1948.*
Kaarlo Jaakko Temmes, *B.S., Finland's Institute of Technology, 1946.*
Robert Edwin Trudel, Jr., *B.S., New York University, 1949.*
John Bennett Wainwright, *B.S., Montana State College, 1950.*
Donald Adair Wallace, *B.S., University of Wyoming, 1950.*
Yusuf Amon Yoler, *B.S., Istanbul American College, 1949.*
Edward Edom Zukoski, *A.B., Harvard College, 1950.*

Civil Engineering

- Robert Hildebrand Ahlers, Lt., U.S.A., *B.S., United States Military Academy, 1946.*
Ricardo Manuel Arosemena, *B.A.E., Catholic University of America, 1949; B.C.E., 1950.*
Remi Joseph Bourdages, *B.S., University of Massachusetts, 1950.*
Arthur Leslie Freer, Capt., U.S.A., *B.S., California Institute of Technology, 1950.*
Leland Ray Gardner, *B.S., Stanford University, 1950.*
Albert Otte Grote, *B.S., California Institute of Technology, 1943.*

Richard Henry Homewood, *B.S., University of Massachusetts, 1950.*
 John Robert Jannarone, Lt. Col., U.S.A., *B.S., Montclair State Teachers College, 1948.*
 Lloyd Edward Kaechele, *B.S., Michigan State College, 1949.*
 Donald D. MacDougall, *B.S. (in E.E.) California Institute of Technology, 1945; B.S. (in C.E.) 1950.*
 Richard George Merritt, *B.S., Yale University, 1950.*
 Jay Allen Montgomery, *B.S., California Institute of Technology, 1950.*
 Donald Jay Oswald, *B.S., California Institute of Technology, 1950.*
 Harry Sutcliffe, *B.Sc., University of Manchester, 1950.*
 William Ward Watkin, Jr., Major U.S.A., *B.S., United States Military Academy, 1942.*

Electrical Engineering

Leon Joseph Bass, *B.S., California Institute of Technology, 1949.*
 Noshir Kaiki Bengalli, *B.Sc., Bombay University, 1948; B.E.E., Rensselaer Polytechnic Institute, 1950.*
 Henry Antoine Dopchie, *E.C.E., Université Catholique Louvain, 1950.*
 Robert Larimer Gottier, *B.S., California Institute of Technology, 1950.*
 Jay Watson Gear, Jr., *B.S.E.E., Purdue University, 1950.*
 Robert Harold Harner, *B.S., Northwestern Technological Institute, 1950.*
 Richard Val Henry, *B.S., California Institute of Technology, 1945.*
 Jerome E. Jacobs, *B.S., California Institute of Technology, 1950.*
 Jacob Parseh Lafdjian, *B.S., Technical University of Istanbul, 1933.*
 William D. Lansdown, *B.S., California Institute of Technology, 1950.*
 Albert Edward McLellan, *B.S., California Institute of Technology, 1950.*
 Jan Arne Narud, *B.S., California Institute of Technology, 1951.*
 William Howard Proud, *B.S., California of Technology, 1950.*
 Ronald Lewis Quandt, *B.S., California Institute of Technology, 1950.*
 Marvin B. Rudin, *B.S., California Institute of Technology, 1950.*
 Alvaro Salgado Farias, *C.E., National University, 1947.*
 Charles Anthony Savant, *B.S., California Institute of Technology, 1949.*
 Richard Earl Springer, *B.S., California Institute of Technology, 1945 (Degree awarded posthumously.)*
 William Duane Staples, *B.S., Michigan State College, 1949.*
 Richard Zaven Toukdarian, *B.S., Rensselaer Polytechnic Institute, 1950.*

Mechanical Engineering

Galt Buhler Booth, *B.S., California Institute of Technology, 1950.*
 John Martin Bozajian, *B.S., University of California, 1950.*
 Ellsworth Allen Brown, Jr., *B.S., State University of Iowa, 1950.*
 Joseph Melvin Carter, *B.M.E., Cornell University, 1950.*
 Lowell C. Cockell, Jr., *B.S., California Institute of Technology, 1950.*
 Erdem I. Ergin, *B.S., Montana State College, 1950.*
 Julius Hermann, *B.Sc., Rutgers University, 1950.*
 Marc Kampé de Fériet, *Ingénieur E.C.P., École Centrale, 1943.*

(MASTER OF SCIENCE IN ENGINEERING—*Mechanical Engineering*, cont.)

- Thorbjorn Karlsson, B.S., *Illinois Institute of Technology*, 1950.
Gordon John MacLeod, B.S., *University of California*, 1949.
Craig Marks, B.S., *California Institute of Technology*, 1950.
James Oeland McCaldin, B.A., *University of Texas*, 1944; B.S., *California Institute of Technology*, 1950.
Derrick George Murkett, B.Sc., *University of London*, 1945.
Gibson Oakes, B.S., *California Institute of Technology*, 1950.
Irving Lee Odgers, B.S., *California Institute of Technology*, 1950.
Joseph Edward Padgett, Jr., B.E., *John Hopkins University*, 1948.
John Elmer Plapp, B.S., *Rice Institute*, 1950.
Dean Arthur Rains, B.S., *California Institute of Technology*, 1950.
Eugene Sevin, B.S., *Illinois Institute of Technology*, 1949.
Henry Shapiro, B.S., *California Institute of Technology*, 1950.
Virgil Jones Sims, Jr., B.S., *California Institute of Technology*, 1950.
Allan Joseph Summers, B.S., *Missouri School of Mines and Metallurgy*, 1941.

ENGINEER'S DEGREES

Aeronautical Engineer

- Raymond Louis Angelo, Lt. Comdr., U.S.N., B.S., *United States Naval Academy*, 1942.
Edwin George Dankworth, Jr., Lt. Comdr., U.S.N., B.S., *United States Naval Academy*, 1942.
Harold William Davidson, B.S., *New York University*, 1948; M.S., *California Institute of Technology*, 1949.
Carl Oreal Holmquist, Lt. Comdr., U.S.N., B.S., *United States Naval Academy*, 1942.
Richard Frank Hughes, B.S., *Carnegie Institute of Technology*, 1942; M.S., *California Institute of Technology*, 1949.
~~Saul Kaplan, B.S., California Institute of Technology, 1948; M.S., 1949.~~
James Benjamin Kendrick, B.S., *Massachusetts Institute of Technology*, 1934; M.S., 1937.
John Henry Lobdell, Lt. Comdr., U.S.N., B.S., *United States Naval Academy*, 1942.
James Caspar Norris, Jr., Major, U.S.M.C., B.E., *Vanderbilt University*, 1941; M.S., *Harvard University*, 1942.
Max Howell Ostrander, Lt. Comdr., U.S.N., B.S., *United States Naval Academy*, 1941.
Edwin Pounder, B.S., *California Institute of Technology*, 1946; M.S., 1948.
~~George Tolmie Skinner, B.S., University of St. Andrews, 1948; M.S., California Institute of Technology, 1949.~~
Arthur Dewey Struble, Jr., Lt. Comdr., U.S.N., B.S., *United States Naval Academy*, 1942.
Jay William Stuart, Jr., B.S., *California Institute of Technology*, 1946; M.S., 1948.
Donald Petrilla Walker, Lt., U.S.N., A.B., *San Jose State College*, 1938; B.S., *Stanford University*, 1940.

Electrical Engineer

~~Salim Sion Solomon, B.S., Fouad 1st. University, 1948; M.S., California Institute of Technology, 1949.~~

Mechanical Engineer

Wilbur Milton Swanson, B.S., California Institute of Technology, 1944; M.S., 1948.

DOCTOR OF PHILOSOPHY

~~Peter Louis Auer.~~ (Chemistry and Physics), B.A., Cornell University, 1947. Thesis: I. Kinetics and Mechanism of Addition of Hydrogen Chloride to 2, 3-Dimethylbutadiene. II. Theory of Visco-Elastic Behavior and Flow Birefringence in Solutions of Rod-like Macromolecules.

B. Gunnar Bergman. (Chemistry and Physics), Ch.Engr., Swedish Royal University of Technology, 1947. Thesis: I. A Structural Investigation of the Mercury-Tin System. II. The Determination of the Crystal Structure of the Sigma Phase by Application of X-Ray Diffraction Methods to This Phase in the Iron-Chromium and Iron-Molybdenum Systems.

Virgil Jennings Berry, Jr. (Chemical Engineering and Physics), B.E., Vanderbilt University, 1948; M.S., California Institute of Technology, 1949. Thesis: Temperature and Velocity Distribution in Non-uniform Turbulent Flow.

~~Zegmond Oscar Bleviss.~~ (Aeronautics and Mathematics), B.S., University of California, 1944; M.S., California Institute of Technology, 1947. Thesis: Interference Effects in Supersonic Flow.

James Roy Brown. (Physics and Mathematics), B.S., Allegheny College, 1944; M.S., California Institute of Technology, 1948. Thesis: Gamma-Ray Wavelength Measurements of Gold 198, Iodine 131, Cobalt 60, and Tantalum 182 Using a Curved Crystal Focusing Spectrometer.

Arthur Earl Bryson, Jr. (Aeronautics and Mathematics), B.S., Iowa State College, 1946; M.S., California Institute of Technology, 1949. Thesis: An Interferometric Wind Tunnel Study of Transonic Flow Past Wedge and Circular Arc.

Stuart Donald Cavers. (Chemical Engineering and Chemistry), B.A.Sc., University of British Columbia, 1942; M.A.Sc., 1946. Thesis: Heat and Mass Transfer Studies. I. Transfer of Heat and Momentum in Uniform Turbulent Air Streams. II. Evaporation of Water Drops in a Turbulent Air Stream.

~~Donald Walter Clarke.~~ (Chemistry and Animal Physiology), B.Sc., University of Alberta, 1941; M.Sc., 1943. Thesis: I. Attempts to Isolate the RH Antigen from Red Blood Cells. II. The Fractionation of an Anti-RH Serum. III. A Comparison of the Vasoconstrictor Actions of Adrenaline and Nor-Adrenaline.

Roderick Keener Clayton. (Physics and Biophysics), B.S., California Institute of Technology, 1947. Thesis: Phototaxis of *Rhodospirillum rubrum*.

George Horace Cleland. (Chemistry and Genetics), B.A., Occidental College, 1942. Thesis: I. An Investigation of the Dakin-West Reaction. II. The Role of Peroxides in Mutagenesis.

George Clement Dacey. (Physics and Mathematics), B.S., University of Illinois, 1942. Thesis: Design and Calibration of a New Apparatus to Measure the Specific Electronic Charge.

Robert Briggs Day. (Physics and Mathematics), A.B., Haverford College, 1943; M.S., California Institute of Technology, 1947. Thesis: Angular Distributions of Some Gamma-Rays Produced in Nuclear Reactions.

Daniel Harold Deutsch. (Chemistry and Mathematics), B.S., California Institute of Technology, 1948. Thesis: I. The Synthesis of Spiro (3, 5)-nonane. II. The Presumed Synthesis of 1, 3-Cyclobutanedicarboxylic Acid by Markownikoff and Krestownikoff. III. The Synthesis of Cis- and Trans-1, 3-Cyclobutanedicarboxylic Acids.

~~Satish Dhawan.~~ (Aeronautics and Mathematics), B.A., Punjab University, 1948; M.A., 1941; B.Sc., University of Minnesota, 1944; M.S., 1947. Thesis: Direct Measurements of Skin Friction.

Robert James Diamond. (Mathematics and Physics), B.S., Queensland University, 1937. Thesis: A Type of Pseudo-norm.

(DOCTOR OF PHILOSOPHY, cont.)

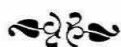
- Howard Henry Dixon. (Aeronautics and Mathematics), B.Sc., *Manitoba University*, 1939; A.E., *California Institute of Technology*, 1944. Thesis: *Stresses and Deflections of Unswept and Swept Thin Walled Beams*.
- David Lewis Douglas. (Chemistry and Physics), B.S., *California Institute of Technology*, 1947. Thesis: I. *The Magnetic Susceptibilities of Eu(III) and Eu(II) Ions and the Photochemical Reduction of Water by Eu(II) Ion*. II. *The Magnetic Susceptibilities of Europium and Samarium Amalgams*. III. *Observations on the Chemistry of Europium*. IV. *Age Determination by Carbon-14 Content: Ionization Chamber Techniques*. V. *The Volume Change Due to Hydrogen Bonding of Methanol in Carbontetrachloride Solution*.
- Donal Baker Duncan. (Physics and Mathematics), B.S., *California Institute of Technology*, 1945. Thesis: *A Study of the Transmutation of Nitrogen by Protons*.
- ~~Harry McPhoe Ellis~~. (Electrical Engineering and Physics), B.Ap.Sc., *University of British Columbia*, 1945; M.S., *California Institute of Technology*, 1948. Thesis: *Dielectric Recovery Characteristics of Power Arcs in Large Air Gaps*.
- Gaelen Leo Felt. (Physics and Electrical Engineering), A.B., *Harvard College*, 1943; M.S., *California Institute of Technology*, 1949. Thesis: *A Measurement of the Value of h/e by the Determination of the Short Wavelength Limit of the Continuous X-Ray Spectrum at 25 Kilovolts*.
- Clarence Rollins Gates. (Electrical Engineering and Mathematics), B.S., *University of Oklahoma*, 1947. Thesis: *Probability Distributions of the Zeros of Random Noise*.
- Forrest Richard Gilmore. (Physics and Mathematics), B.S., *California Institute of Technology*, 1944. Thesis: *The Kinetics of Condensation and Vaporization*.
- Donald Theodore Greenwood. (Electrical Engineering and Physics), B.S., *California Institute of Technology*, 1944; M.S., 1948. Thesis: *Analog Methods of Non-linear Vibration Analysis*.
- William Thomas Guy. (Mathematics and Physics), B.S., *Texas Agricultural and Mechanical College*, 1940; M.A., *University of Texas*, 1948. Thesis: *Contributions to Tensor Analysis*.
- ~~Francis Arthur Haskins~~. (Genetics and Plant Physiology), B.S., *University of Nebraska*, 1943; M.S., 1948. Thesis: *Biochemical Genetics of Neurospora Pertaining to Various Aromatic Metabolites*.
- Carl Wilhelm Helstrom. (Physics and Mathematics), B.S., *Lehigh University*, 1947; M.S., *California Institute of Technology*, 1949. Thesis: *The Production and Annihilation of Anti-Protons*.
- Harold Marvin Hipsh. (Aeronautics and Mathematics), B.S., *California Institute of Technology*, 1947; M.S., 1948. Thesis: *Harmonic Oscillations of a Narrow Delta Wing in Supersonic Flow*.
- Richard Arthur Hoppin. (Petrology and Micropaleontology), B.A., *University of Minnesota*, 1942; M.A., 1947. Thesis: I. *The Geology of the Palen Mountains Gypsum Deposit, Riverside County, California*. II. *Oscillations in the Foraminifera of the Vicksburg Group from a Well in George County, Mississippi*.
- Herbert Mitchell Hull. (Plant Physiology and Genetics), B.S., *University of California*, 1946. Thesis: *The Effect of Temperature on Carbohydrate Translocation in the Tomato Plant*.
- Arnold Axtell Jensen. (Aeronautics and Mathematics), B.S., *University of Minnesota*, 1939; M.S., *California Institute of Technology*, 1947. Thesis: *A Slender Cone Starting Impulsively*.
- ~~Hewelllyn Hosford Jones~~. (Chemistry and Physics), B.S.E., *University of Michigan*, 1942; M.A., *University of Buffalo*, 1947. Thesis: I. *Infrared Studies of Hydrogen Bonding of Methanol with Aromatic Hydrocarbons*. II. *Infrared Spectrum and Molecular Structure of Nitrous Acid*. III. *Infrared Spectra and Molecular Structure of Isocyanic Acid, and Isothiocyanic Acid*.
- David Joseph Klein. (Physics and Mathematics), B.S., *California Institute of Technology*, 1943. Thesis: *Precision Measurement of Gamma-Ray Wavelengths of the Radium and Thorium Series Using the Focusing Crystal Spectrometer*.
- Herbert Arthur Lassen. (Mechanical Engineering and Electrical Engineering), B.S., *California Institute of Technology*, 1943; M.S., 1947. Thesis: *The Analytical Computation of Residual Thermal Stresses*.
- Gordon Eric Latta. (Mathematics and Aeronautics), B.A., *University of British Columbia*, 1947. Thesis: *Singular Perturbation Problems*.
- ~~Pierre Jean Leroux~~. (Chemistry and Genetics), *Candidat en sciences chimiques, University of Liège*, 1947; M.S., *California Institute of Technology*, 1949. Thesis: *Kinetics and Stereochemistry of the Hydrolysis of Esters of Nitric, Sulfuric and p-Toluenesulfonic Acids*.

- Cheng-Wu Li. (Physics and Biophysics), A.B., National Tsing-Hua University, 1938. Thesis: Nuclear Reactions with a Proton Magnetic Spectrograph.
- ~~Paul Lieber~~. (Geophysics and Mathematics), M.S., California Institute of Technology, 1941. Thesis: On Relaxation Phenomena and the Origin of Earthquakes.
- Shih-Chun Lo. (Aeronautics and Mathematics), B.S., National Central University of Nankin, 1945; M.S., University of Minnesota, 1948. Thesis: Oscillating Airfoil in Parallel Streams Separated by an Interface.
- ~~Harden Marsden McConnell~~. (Chemistry and Physics), B.S., George Washington University, 1947. Thesis: I. Investigation of Possible Interactions between Thallium (I) and Thallium (III) in Solution and in the Crystalline Thallium Sesqui-Halides. II. Spectrophotometric Investigation of the Copper (II) Chloro-Complexes in Aqueous Solutions of Unit Ionic Strength. III. Optical Interaction between the Chloro-Complexes of Copper (I) and Copper (II) in Solutions of Unit Ionic Strength. Interpretations of the Spectral Absorption of a Copper (I) - Copper (II) Chloro-Complex. IV. Spectrophotometric Investigation of the Interaction between Iron (II) and Iron (III) in Hydrochloric Acid Solutions.
- Irving Michelson. (Aeronautics and Mathematics), B.S., Georgia School of Technology, 1943; M.S., California Institute of Technology, 1947. Thesis: I. On Dust Devils. II. Linearized Theory of Conical Turbomachines.
- Gerald Morgan Monroe, Lt., U.S.N. (Aeronautics and Mathematics), Ae.E., California Institute of Technology, 1949. Thesis: A Study of Compressible Perfect Fluid Motion in Turbomachines with Infinitely Many Blades.
- Antony John Andrew Morgan. (Aeronautics and Mathematics), B.S., California Institute of Technology, 1944; M.S., 1947. Thesis: Turbulence in Supersonic Flow.
- David Eugene Muller. (Physics and Mathematics), B.S., California Institute of Technology, 1947. Thesis: A Precision Measurement of the Wave Lengths of Gamma and X-Radiation Following Decay of Iridium 192 and Tungsten 187, by Means of the Focusing Crystal Diffraction Spectrometer.
- Jack Norman Nielsen. (Aeronautics and Mathematics), B.S., University of California, 1941; M.S., California Institute of Technology, 1949. Thesis: Supersonic Wing-Body Interference.
- ~~Jean-Paul Nitech~~. (Plant Physiology and Bio-organic Chemistry), Dipl. Ing. Agronome, Institut National Agronomique, 1947. Thesis: The Role of Plant Hormones in Fruit Development.
- Telford Wilbert Oswald. (Aeronautics and Mathematics), A.B., Stanford University, 1939; S.M., Harvard University, 1940; M.S., California Institute of Technology, 1947. Thesis: The Influence of Variable Air Density and of Non-Linear Aerodynamic Characteristics on Dynamic Behavior at Supersonic Speeds.
- ~~Kenneth Deigan~~. (Biochemistry and Chemistry), B.A., Johns Hopkins University, 1946. Thesis: Studies on the Source of Urea Carbon.
- Eugene Newman Parker. (Physics and Mathematics), B.S., Michigan State College of Agriculture, 1948. Thesis: Interstellar Dust and Gas Structures.
- Geoffrey Vernon Parkinson. (Aeronautics and Mathematics), B.S., University of British Columbia, 1946; M.S., California Institute of Technology, 1948. Thesis: Unit-Step Motion of a Wide Delta Wing.
- ~~William Duncan Rannie~~. (Aeronautics and Mathematics), B.A., University of Toronto, 1936; M.A., 1937. Thesis: Heat Transfer in Turbulent Shear Flow.
- ~~Maurice Rattray, Jr.~~ (Physics and Mathematics), B.S., California Institute of Technology, 1944; M.S., 1947. Thesis: Perturbation Effects in Cavitation Bubble Dynamics.
- Donald Sage Robertson. (Genetics and Plant Physiology), B.A., Stanford University, 1947. Thesis: A Study of Viviparous Mutants of Maize.
- Harold Alvin Rosen. (Electrical Engineering and Aeronautics), B.E., Tulane University, 1947; M.S., California Institute of Technology, 1948. Thesis: Applications of the Potential Analogy to Network Analysis.
- Malvin Avram Ruderman. (Physics and Mathematics), A.B., Columbia College, 1945; M.S., California Institute of Technology, 1947. Thesis: I. Electron Decay of the Pi-Meson. II. A Non-Linear Field Theory.
- ~~Alexis Wolfgang Schardt~~. (Physics and Mathematics), B.S., California Institute of Technology, 1944. Thesis: The N^{15} and H^1 Reactions.

(DOCTOR OF PHILOSOPHY, cont.)

- ~~John Dorrington Seagrave.~~ (Physics and Mathematics), B.S., California Institute of Technology, 1946; M.S., 1948. Thesis: Radiative Capture of Protons by C^{12} and C^{13} .
- ~~Aaron Jay Seriff.~~ (Physics and Mathematics), B.S., University of Texas, 1944; M.S., 1946. Thesis: Cloud Chamber Observations of the New Unstable Cosmic Ray Particles.
- ~~San-Chün Shen.~~ (Genetics and Biochemistry), B.S., National Southwest Associated University, 1942. Thesis: Genetics and Biochemistry of the Cysteine-Tyrosine Relationship in Neurospora.
- Albert Siegel. (Genetics and Biochemistry), B.A., Cornell University, 1947. Thesis: I. Irradiation Experiments with *Neurospora crassa*. II. An Electrophoretic Comparison of the Soluble Proteins of Normal and Virus-Infected *Escherichia coli*.
- Bernard Owen Stenson. (Electrical Engineering and Physics), B.S., Illinois Institute of Technology, 1944; M.S., California Institute of Technology, 1948. Thesis: Radar Methods for the Exploration of Glaciers.
- Richard Bennett Talmadge. (Mathematics and Physics), B.S., California Institute of Technology, 1948. Thesis: The Representation of Baire Functions.
- Dudley Watson Thomas. (Chemistry and Biology), A.B., University of California, 1942; M.S., California Institute of Technology, 1947. Thesis: Studies on the Purification and Properties of L-Leucine and on the Mode of Action of Trypsin and Chymotrypsin.
- Robert G. Thomas. (Physics and Mathematics), B.S., California Institute of Technology, 1944; M.S., 1947. Thesis: I. Spectrometer Measurements of the Rates of Gamma Radiation and Internal Pair Formation from Some Nuclear Reactions in Light Nuclei. II. Theory of the Energy Levels of the Mirror Nuclei, C^{13} and N^{13} .
- Emanuel Windsor. (Biochemistry and Plant Physiology), B.S., California Institute of Technology, 1938; M.S., 1948. Thesis: Alpha-Aminoadipic Acid as a Constituent of a Natural Protein.
- ~~William Wayne Wood.~~ (Chemistry and Physics), B.S., Montana State College, 1947. Thesis: Theoretical and Experimental Investigations on Optical Rotatory Power.
- Eric John Woodbury. (Physics and Mathematics), B.S., California Institute of Technology, 1947. Thesis: Capture Cross Section of C^{13} for Low Energy Protons.
- Lauren Albert Wright. (Petrology and Invertebrate Paleontology), A.B., University of Southern California, 1940; M.S., 1943. Thesis: I. Geology and Origin of Talc Deposits of Eastern California. II. An Invertebrate Assemblage from the "Modelo" Formation of Reynier Canyon, Los Angeles County, California.
- Alexander Wyll. (Aeronautics and Mathematics), B.S., Georgia School of Technology, 1941; M.S., Massachusetts Institute of Technology, 1946. Thesis: A Second-Order Solution for an Oscillating, Two-Dimensional, Supersonic Airfoil.

Undergraduate Prize Awards



CONGER PEACE PRIZE ORATION

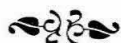
Established in 1912 by the late Everett D. Conger, D. D.

FIRST PRIZE:

SANFORD S. SWEET

SECOND PRIZE:

EDWARD B. CRICHTON



MARY A. EARL MCKINNEY PRIZE IN ENGLISH

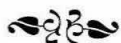
*Established in 1946 by Samuel P. McKinney, M. D., of Los Angeles,
as a memorial to his mother*

FIRST PRIZE:

SANFORD S. SWEET

SECOND PRIZE:


KWOK-YING CHONG



FREDERIC W. HINRICHS, JR., MEMORIAL AWARD

THE RECIPIENT OF THE AWARD IS ANNOUNCED
EACH YEAR AT COMMENCEMENT

This award was established in 1948 by the Trustees of the Institute in memory of Frederic W. Hinrichs, Jr., member of the Institute Faculty and Dean, 1921 to 1944. The award is made annually to "the senior who, in the opinion of the undergraduate Deans, has throughout his years at the Institute made the greatest contribution to the welfare of the student body and whose qualities of leadership, character, and responsibility have been outstanding."

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