

CALIFORNIA INSTITUTE OF TECHNOLOGY

*Seventy-Third
Annual Commencement
June 9, 1967*



CALIFORNIA INSTITUTE OF TECHNOLOGY

*Seventy - Third
Annual
Commencement*

FRIDAY AFTERNOON AT FOUR-THIRTY O'CLOCK
JUNE NINTH, NINETEEN SIXTY-SEVEN

Academic Procession

Chief Marshal, David S. Wood, Ph.D.

Assistant Marshals

William H. Corcoran, Ph.D. Richard A. Dean, Ph.D.

Hardy C. Martel, Ph.D.

MARCHING ORDER

Division I

CANDIDATES FOR THE DEGREE OF BACHELOR OF SCIENCE

CANDIDATES FOR THE DEGREE OF MASTER OF SCIENCE

CANDIDATES FOR THE DEGREE OF ENGINEER

CANDIDATES FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

Division II

THE FACULTY

THE CHAIRMEN OF DIVISIONS

THE DEANS

THE PROVOST

THE TRUSTEES

THE COMMENCEMENT CHAPLAIN

THE PRESIDENT

THE CHAIRMAN OF THE BOARD OF TRUSTEES

Program

CALIFORNIA INSTITUTE OF TECHNOLOGY

SEVENTY-THIRD ANNUAL

COMMENCEMENT

PRESIDING: ARNOLD O. BECKMAN, Ph.D., LL.D.

Chairman of the Board of Trustees

PRELUDE AND PROCESSIONAL

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

INVOCATION The Reverend George F. Regas

All Saints Episcopal Church, Pasadena

COMMENCEMENT ADDRESS

"The Educational Process"

Lee A. DuBridgE, Ph.D., Sc.D.

President of the California Institute of Technology

Program — continued

CONFERRING OF DEGREES . . . President DuBridge

PRESENTATION OF CANDIDATES FOR DEGREES

For the degree of Bachelor of Science . Foster Strong, M.S.

*Dean of Freshmen
representing the Dean of Students*

For the degree of Master of Science . Harold Lurie, Ph.D.

Associate Dean of Graduate Studies

For the degree of Engineer . H. Frederic Bohnenblust, Ph.D.

Dean of Graduate Studies

For the degree of Doctor of Philosophy . Dean Bohnenblust

CONCLUDING REMARKS President DuBridge

BENEDICTION The Reverend Mr. Regas

RECESSIONAL Mr. Shearer

*The audience is requested to remain standing until
the end of the Recessional*

Candidates for Degrees

BACHELOR OF SCIENCE

- Stephan Barry Abramson, *Oakhurst, New Jersey*. Chemistry.
Terry George Allen, *Salt Lake City, Utah*. Astronomy.
Christopher Henry Bajorek, *Pasadena, California*. Engineering.
George Nick Balanis, *Athens, Greece*. Engineering.
Peter Balint, *Oakland, California*. Engineering.
David Dominick Barbosa, *Wilkes-Barre, Pennsylvania*. Engineering.
James Thomas Beale, *Savannah, Georgia*. Mathematics.
James Fielder Beall, *Lawrenceville, Illinois*. Chemical Engineering.
Terry Dean Beard, *Arvin, California*. Engineering.
Michael James Beeson, *Topeka, Kansas*. Mathematics.
Robert Wayne Berry, *Gilmer, Texas*. Biology.
Alfred John Bersbach II, *Tucson, Arizona*. Physics.
Donald George Blair, *Livingston, Montana*. Chemistry.
Thomas Durrell Bostick, *Camden, New Jersey*. Mathematics.
George Stephen Brown, *Santa Monica, California*. Physics.
Stephen Laurence Browne, *Los Angeles, California*. Physics.
Thomas Joel Buckholtz, *Palos Verdes Estates, California*. Mathematics.
Michael Akylas Caloyannides, *Athens, Greece*. Engineering.
Craig Louis Carlyle, *Dinuba, California*. Engineering.
Douglas Arthur Carne, *Pasadena, California*. Engineering.
Gary Gordon Christoph, *Chicago, Illinois*. Chemistry.
Benjamin Grosvenor Cooper, *Chicago, Illinois*. Mathematics.
Martin David Cooper, *Los Angeles, California*. Physics.
Peter Newell Cross, *Sandwich, Massachusetts*. Biology.
Stewart R. Davey, *Lowville, New York*. Geophysics.
Jerry Lynn Dessinger, *Tulsa, Oklahoma*. Astronomy.
Randolph Paul Dickinson, *San Diego, California*. Biology.
Robert George Dickinson, *Tarzana, California*. Engineering.
Larry Edward Dillehay, *Ventura, California*. Physics.
Douglas Michael Eardley, *Seattle, Washington*. Physics.
Douglas Charles Eaton, *Rockville, Maryland*. Biology.
Gareth Winston Edwards, *Granada Hills, California*. Physics.
Glenn Eric Engebretsen, *Playa del Rey, California*. Mathematics.
Norbert Ensslin, *Fresno, California*. Physics.
Daniel Edwin Erickson, *Salinas, California*. Mathematics.

Students whose names appear in boldface type are being graduated with honor in accordance with a vote of the Faculty.

BACHELOR OF SCIENCE—*continued*

- James Martin Evans, *Lake Grove, Oregon*. Engineering.
John Robert Eyler, *Wilmington, Delaware*. Chemistry.
Roger Allen Fajman, *San Lorenzo, California*. Mathematics.
Jim Elliott Fishbein, *Chicago, Illinois*. Engineering.
Michael Glen Foley, *Independence, Missouri*. Engineering.
John Benjamin Foster, *Phoenix, Arizona*. Biology.
Ted Tsutomu Fujimoto, *Los Angeles, California*. Chemistry.
Frank Kazumi Fujimura, *Santa Cruz, California*. Chemistry.
Dennis Masato Furuike, *San Mateo, California*. Engineering.
Anthony John Gharrett, *Rockport, Massachusetts*. Biology.
Kim Dean Gibson, *Idaho Falls, Idaho*. Mathematics.
Kimberly Reed Gleason, *Portland, Oregon*. Engineering.
Joel Goldberg, *Los Angeles, California*. Chemistry.
David Michael Goodmanson, *Mercer Island, Washington*. Physics.
Norton Robert Greenfeld, *Miami, Florida*. Mathematics.
Richard Dale Hackathorn, *Akron, Ohio*. Engineering.
Marshall Hall III, *Pasadena, California*. Biology.
William Gary Hammer, *Spokane, Washington*. Engineering.
David Arthur Hammond, *Newport Beach, California*. Engineering.
Eric Ferrand Harslem, *Shaker Heights, Ohio*. Engineering.
Jimmy Lee Held, *Altadena, California*. Engineering.
Terrill Willard Hendrickson, *Arlington, Washington*. Mathematics.
Ira Herskowitz, *New Rochelle, New York*. Biology.
Michael Richard Hess, *Oreland, Pennsylvania*. Engineering.
John Brent Hoerner, *Visalia, California*. Engineering.
Howard M. Hoffman, *White Plains, New York*. Economics.
Edward Shi-Ping Hsi, *St. Paul, Minnesota*. Chemistry.
Bruce Samuel Hudson, *Plymouth, Michigan*. Chemistry.
Gary Gene Ihas, *Red Bank, New Jersey*. Physics.
Walter R. Innes, *Upland, California*. Physics.
Gary Allan Jaegers, *Sacramento, California*. Economics.
George E. Jahn, *St. Paul, Minnesota*. Physics.
Gray Jennings, *Houston, Texas*. Mathematics.
Edward Charles Kelm, *Vista, California*. Engineering.
Joseph D. Kinkade, Jr., *Pass Christian, Mississippi*. English.
Peter Lawrence Krause, *Lakewood, California*. Engineering.
Frederick Keithley Lamb, *Manhattan, Kansas*. Physics.
Richard Allen Landy, *St. Louis, Missouri*. Physics.
Stacy Guy Langton, *Salt Lake City, Utah*. Mathematics.
Paul Lung Sang Lee, *Hong Kong*. Physics.
York Liao, *Hong Kong*. Physics.

BACHELOR OF SCIENCE—*continued*

- Erik Alexander Lippa**, *Minneapolis, Minnesota*. Mathematics.
Gary William Little, *South Gate, California*. Engineering.
Andrew D. MacKay, *San Diego, California*. Physics.
Myron Jay Mandell, *Mount Vernon, New York*. Physics.
Joseph Walter Manke, *Lantana, Florida*. Mathematics.
Zachary Martin, *Los Angeles, California*. Mathematics.
Duane Paul McClure, *Missoula, Montana*. Geology.
James Huston McCulloch IV, *Boulder, Colorado*. Economics.
James Murray McDonald, *Washington, D.C.* Geochemistry.
Thomas Charles McKenzie, *Wenatchee, Washington*. Chemistry.
Charles Edwin McQuillan, *Des Moines, Iowa*. Mathematics.
Daniel Stefan Metlay, *Los Angeles, California*. Biology, History.
Robert John Miller, *Milwaukee, Wisconsin*. Chemistry.
William Booth Miller, *Tucson, Arizona*. Engineering.
Robert Lester Milton, *Arcadia, California*. Astronomy.
William Charles Mitchell, *Oxford, Ohio*. Mathematics.
Charles Thomas Molloy, *Altadena, California*. Mathematics.
Reagan Wentworth Moore, *Fillmore, California*. Physics.
Robert Charles Neveln, *Galesburg, Illinois*. Mathematics.
Shahbaz Noorvash, *Teheran, Iran*. Mathematics.
Kenneth Hugh Nordsieck, *Santa Barbara, California*. Astronomy.
Martin Yasuyuki Oiye, *Seattle, Washington*. Engineering.
John Edwin O'Pray, *Oxon Hill, Maryland*. Engineering.
Douglas Dean Osheroff, *Aberdeen, Washington*. Physics.
Philip Lowell Paine, *Orlando, Florida*. Biology.
Robert Daniel Parker, *Santa Rosa, California*. Engineering.
James Edward Pearson, *Phoenix, Arizona*. Engineering.
Arlin Robert Peters, *Woodland, California*. Chemical Engineering.
Ronald Edward Peterson, *St. Paul, Minnesota*. Physics.
Robert Libero Piccioni, *La Jolla, California*. Physics.
Michael Stephen Pollock, *Saratoga, California*. Engineering.
Alan Leslie Porter, *Encino, California*. Chemical Engineering.
Franklin Gregory Potter, *Monterey Park, California*. Engineering.
Leslie V. Powers, *Coalinga, California*. Engineering.
Earl D. Reiland, *St. Paul Minnesota*. Engineering.
Michael Cornelius Robel, *Los Angeles, California*. Physics.
Jonathan Daniel MacLeish Romney, *Paramus, New Jersey*. Astronomy.
Mark A. Satterthwaite, *Wellesley Hills, Massachusetts*. Economics.
Gary Wayne Schnuelle, *Sparta, New Jersey*. Chemistry.
Robert Hyllel Schor, *Visalia, California*. Biology.
George Frederick Sharman III, *San Diego, California*. Geology.

BACHELOR OF SCIENCE—*continued*

- Ping Sheng**, *China*. Physics.
- Gregory Richard Shuptrine**, *Montebello, California*. Chemical Engineering.
- William Bryant Simpson, *Winchester, Massachusetts*. Physics.
- Martin Leo Smith**, *Mill Valley, California*. Geophysics.
- James Martin Soha, *Eugene, Oregon*. Physics.
- Erik Storm, *Oslo, Norway*. Engineering.
- Duke A. Sun**, *Pittsburgh, Pennsylvania*. Physics.
- Henry H. Suzukawa, Jr., *San Bruno, California*. Chemistry.
- Clifford Joel Tedder, *Saratoga, California*. Engineering.
- Stephen Clifford Teigland, *Rock Island, Illinois*. Economics.
- Peter Charles Theisinger, *Rockledge, Florida*. Physics.
- Richard H. Touton**, *Fresno, California*. Engineering.
- Steven Robert Tyler**, *San Marino, California*. Physics.
- David Clinton Van Essen**, *Sacramento, California*. Chemistry.
- Victor Wang, *Los Angeles, California*. Engineering.
- Terrill Richard Warren, *Seattle, Washington*. Mathematics.
- Dennis Edward White**, *San Bernardino, California*. Mathematics.
- George J. Williams, *Winter Park, Florida*. Economics.
- Glenn Lloyd Williams, *Park Forest, Illinois*. Engineering.
- John Scott Williams, *Baton Rouge, Louisiana*. Physics.
- Paul Frazer Williams II, *Pueblo, Colorado*. Physics.
- Richard Jay Williams, *Granada Hills, California*. Engineering.
- David Roy Woodward, *Carlisle, Massachusetts*. Physics.
- Eric Daniel Young**, *Elko, Nevada*. Engineering.

MASTER OF SCIENCE

- Surendra Nagindas Adodra (*Mechanical Engineering*). B.E., University of Bombay, 1966.
- William Longstreet Ames (*Physics*). S.B., Massachusetts Institute of Technology, 1964.
- Dana Gene Andrews (*Aeronautics*). B.S., University of Washington, 1966.
- Michael Paul Anthony (*Electrical Engineering*). B.S., California Institute of Technology, 1966.
- James Warren Austin (*Electrical Engineering*). B.S., California Institute of Technology, 1966.
- Mary Baker (*Applied Mechanics*). B.S.E.M., University of Wisconsin, 1966.
- James Henry Barbee (*Chemical Engineering*). B.S., University of Washington, 1965, 1966.
- Benjamin Bar-On (*Mechanical Engineering*). B.Sc., Israel Institute of Technology (Haifa), 1962.
- Kenneth Paul Bartos (*Applied Mechanics*). B.S., University of Nebraska, 1962.
- Robert Georges Bellue (*Civil Engineering*). Ing., École Nationale Supérieure d'Electrotechnique d'Electronique et d'Hydraulique de Toulouse, 1966.
- Richard Henry Bigelow (*Engineering Science*). B.S., California Institute of Technology, 1966.
- Steven Allen Bissell (*Biology*). B.S., Harvey Mudd College, 1965.
- Gérard Emile Bloch (*Electrical Engineering*). Ing., Université de Toulouse, 1966.
- Philippe Jean-Marie Blondy (*Electrical Engineering*). Ing., Institut Polytechnique de Grenoble, 1965.
- Pierre Edmond Bourgain (*Mechanical Engineering*). Ing., École Centrale des Arts et Manufactures, 1965.
- James Ross Boyd (*Chemical Engineering*). B.Eng., Royal Military College of Canada, 1965.
- Alfred Winsor Brown, Jr. (*Electrical Engineering*). B.E.S., Rensselaer Polytechnic Institute, 1966.
- Byron Richard Brown (*Physics*). B.S., University of California (Berkeley), 1965.
- Michael P. Burke (*Aeronautics*). B.S., Parks College, 1966.
- Patricia Virginia Burke (*Physics*). B.A., Pomona College, 1964.
- Harry Shaner Burns (*Electrical Engineering*). B.S.E.E., Pennsylvania State University, 1966.
- Lee Wendel Casperson (*Electrical Engineering*). S.B., Massachusetts Institute of Technology, 1966.
- Douglas Melvin Chabries (*Electrical Engineering*). B.S., University of Utah, 1966.
- Yu-Wen Chang (*Electrical Engineering*). B.A., National Taiwan University, 1959; B.S., University of California (Los Angeles), 1966.
- Robert William Clayton (*Materials Science*). B.Sc., Imperial College of Science and Technology (London), 1966.
- James Alfred John Cutts (*Geophysics*). B.A. (Hons.), St. John's College (Cambridge), 1965.

MASTER OF SCIENCE—*continued*

- John B. Davies (*Geophysics*). B.S., University College of Swansea (Wales), 1963.
- Terrall Martin deJonckheere (*Mechanical Engineering*). B.S., United States Military Academy, 1966.
- Ronald Scott Douglass (*Electrical Engineering*). B.S., California Institute of Technology, 1966.
- Jean-Guy Dufour (*Physics*). B.A., University of Montreal, 1960; B.Sc., 1965.
- Michel Pierre Dupont (*Mechanical Engineering*). Ing., Centre d'Études Supérieures des Techniques Industrielles, 1966.
- Benjamin Nathaniel Early (*Electrical Engineering*). B.S., Howard University, 1966.
- Christopher England (*Chemical Engineering*). B.S., University of Southern California, 1965.
- Payton Delano Fuller (*Mechanical Engineering*). B.Sc., Michigan State University, 1966.
- Vassilios Elias Galanoudes (*Engineering Science*). B.S.E.E., California State College (Los Angeles), 1964.
- Robert Ellis Goldwasser (*Electrical Engineering*). B.S., Washington University, 1966.
- Eitan Gonen (*Mechanical Engineering*). B.S.M.E., Northrop Institute of Technology, 1966.
- Thomas Peaks Grover (*Electrical Engineering*). S.B., Massachusetts Institute of Technology, 1966.
- Michel Jacques Henry (*Chemical Engineering*). Ing., École Nationale Supérieure de Chimie de Rennes, 1965.
- Arthur Stewart Hopkins (*Applied Mechanics*). B.S., California Institute of Technology, 1966.
- Daniel Huaco Oviedo (*Geophysics*). Bachelor, Universidad Nacional de San Agustín de Arequipa (Peru), 1959; Ing., Instituto Geofísico (Peru), 1961.
- Jun Ikeuchi (*Materials Science*). B.E., Tohoku University, 1964; M.E., 1966.
- James Reid Ipser (*Physics*). B.S., Loyola University (New Orleans), 1964.
- Gary Michael Johnson (*Aeronautics*). B.S., United States Air Force Academy, 1966.
- Gordon Oliver Johnson (*Electrical Engineering*). B.S., Walla Walla College, 1966.
- Dennis Robert Kasper (*Civil Engineering*). B.S., Loyola University (Los Angeles), 1966.
- Susan W. Kieffer (*Geological Sciences*). B.S., Allegheny College, 1964.
- William Herbert Kirby (*Chemical Engineering*). B.S., Iowa State University, 1961; M.Sc., Ohio State University, 1962.
- Louis Kircos (*Aeronautics*). B.S., University of Michigan, 1966.
- Ralph Yutaka Komai (*Chemistry*). A.B., Whittier College, 1964.
- Louis Norman Koppel (*Engineering Science*). B.S., University of California (Berkeley), 1966.
- John Thomas Latimore (*Applied Mathematics*). A.B., Occidental College, 1965.

MASTER OF SCIENCE—*continued*

- Johann Ott Lau, Jr. (*Aeronautics*). B.S., California Institute of Technology, 1966.
- Jacques Robert Lejeune (*Mechanical Engineering*). Ing., École Nationale Supérieure du Genie Maritime, 1961.
- Kenneth Raymond Ludwig (*Geochemistry*). B.S., California Institute of Technology, 1965.
- Panagiotis Zissis Marmarelis (*Electrical Engineering*). B.S.E.E., Lehigh University, 1966.
- Frederick Voegtlin Martin (*Mathematics*). B.Sc., University of Alberta, 1963.
- Daniel McCarthy (*Electrical Engineering*). B.E.E., Clarkson College, 1966.
- Robert Thomas Menzies (*Physics*). S.B., Massachusetts Institute of Technology, 1965.
- Charles Marvin Merrow (*Applied Mathematics*). B.A., Whitman College, 1962; M.A., University of Washington, 1963.
- Robert Cox Merton (*Applied Mathematics*). B.S., Columbia University, 1966.
- William Patrick Miller (*Engineering Science*). B.S., California Institute of Technology, 1966.
- Jean Michel Moysan (*Chemical Engineering*). Ing., Université de Nancy, 1962.
- Stephen Auguste Muscanto (*Electrical Engineering*). B.S., Yale University, 1965.
- Lawrence Ronald Newkirk (*Materials Science*). B.S., California Institute of Technology, 1966.
- Richard Carl Nielsen (*Mechanical Engineering*). B.S., California Institute of Technology, 1966.
- John Dennis Nørgard (*Electrical Engineering*). B.E.E., Georgia Institute of Technology, 1966.
- Wilfred Shigeki Otaguro (*Electrical Engineering*). B.S., Rose Polytechnic Institute, 1966.
- William Wallace Owens II (*Mechanical Engineering*). B.S., California Institute of Technology, 1966.
- Karuppagounder Palaniswamy (*Aeronautics*). B.Sc., Nallamuthu Gounder Mahalingam College (India), 1962.
- Navin B. Patel (*Physics*). B.Sc., University of Bombay, 1963; M.Sc., 1965.
- Edward John Patula (*Mechanical Engineering*). B.S., Carnegie Institute of Technology, 1966.
- Kenneth Charles Pedersen (*Electrical Engineering*). B.S., Iowa State University, 1966.
- William Michael Pence (*Civil Engineering*). B.S., California Institute of Technology, 1965.
- John Clyde Perrin (*Aeronautics*). B.S.E.M., Virginia Polytechnic Institute, 1966.
- Edward Harris Perry (*Mechanical Engineering*). B.S., California Institute of Technology, 1966.
- Samuel Thomas Picraux (*Engineering Science*). B.S., University of Missouri, 1965.

MASTER OF SCIENCE—*continued*

- Stephen Dell Rockwood (*Physics*). B.A., Grinnell College, 1965.
- Serge Claude Sabliere (*Electrical Engineering*). Ing., École Centrale des Arts et Manufactures, 1966.
- Bernard Thomas Sander, Jr. (*Electrical Engineering*). B.S., St. Louis University, 1966.
- Anilla Isabel Sargent (*Astronomy*). B.Sc., University of Edinburgh, 1963.
- Zoltan Andrew Sarkozy (*Electrical Engineering*). B.S., Case Institute of Technology, 1966.
- Michel Andre Scavenneq (*Mechanical Engineering*). Ing., École Nationale Supérieure des Mines de Paris, 1966.
- Robert Charles Schoenwiesner (*Electrical Engineering*). B.S.E.E., Newark College of Engineering, 1966.
- Constantine George Sevastopoulos (*Electrical Engineering*). Dipl., University of Athens, 1966.
- James Mathew Seybold (*Mechanical Engineering*). B.S.M.E., University of Cincinnati, 1966.
- Pattamadai Narasimhan Shankar (*Engineering Science*). B.Sc., Imperial College of Science and Technology (London), 1964.
- Joyce Yueh Shen (*Biology*). B.S., National Taiwan University, 1964.
- Nagendra Singh (*Electrical Engineering*). B. Tech., Indian Institute of Technology, 1966.
- Stephen Charles Smith (*Chemistry*). A.B., Western Reserve University, 1964.
- Paul H. Sobel (*Electrical Engineering*). B.E.E., Pratt Institute, 1966.
- Vivian Louise Steadman (*Chemistry*). B.S., Colorado State University, 1963.
- Wayne Raymond Thatcher (*Geophysics*). B.Sc., McGill University, 1964.
- Jeffrey Robert Thomas (*Chemical Engineering*). B.S., Drexel Institute of Technology, 1965.
- Edward Grant Trachman (*Mechanical Engineering*). B.E., The Cooper Union, 1966.
- John Charles Trijonis, Jr. (*Aeronautics*). B.S., California Institute of Technology, 1966.
- Takeshi Tsuji (*Mechanical Engineering*). B.E., Osaka University, 1964.
- David William Vahey (*Electrical Engineering*). S.B., Massachusetts Institute of Technology, 1966.
- Quat Thuong Vu (*Electrical Engineering*). B.S., University of Kentucky, 1965.
- Thomas Glenn Williams (*Aeronautics*). B.E., Rensselaer Polytechnic Institute, 1966.
- David Charles Wilson (*Electrical Engineering*). B.A., Trinity College (Ireland), 1966.
- Wade Joseph Wnuk (*Engineering Science*). B.S., St. Louis University, 1966.
- Max Wyss (*Geophysics*). Dipl., Eidgenössische Technische Hochschule (Zurich), 1964.
- Thomas Man Yang (*Applied Mechanics*). B.S., National Taiwan University, 1961; M.S., University of North Carolina, 1964.
- Thomas King Lin Yu (*Electrical Engineering*). B.S., University of California (Los Angeles), 1966.

ENGINEER

- Jay-Chung Chen (*Aeronautical Engineer*). B.Sc., Taiwan Provincial Cheng Kung University, 1962; M.S., California Institute of Technology, 1964.
- Robert Barnes Eddington (*Aeronautical Engineer*). B.Sc., United States Naval Academy, 1953; M.Sc., Purdue University, 1959.
- Arnold Herbert Henderson (*Aeronautical Engineer*). B.S., University of Kansas, 1958; B.S., U.S. Naval Postgraduate School, 1965.
- Julio Horiuchi Kuroiwa (*Civil Engineer*). Ing., Universidad Nacional de Ingenieria (Peru), 1960; M.S., California Institute of Technology, 1966.
- James Alexander McGill (*Aeronautical Engineer*). B.S., University of Rochester, 1957; B.S., U.S. Naval Postgraduate School, 1965.
- Carlos Navarro-Cantero (*Aeronautical Engineer*). Ing., Escuela Técnica Superior de Ingenieros Aeronáuticos (Madrid), 1964; M.S., California Institute of Technology, 1965.
- Uso Walter (*Aeronautical Engineer*). Dipl., Technische Hochschule Braunschweig, 1965.

DOCTOR OF PHILOSOPHY

- Eric George Adelberger (*Physics*). B.S., California Institute of Technology, 1960.
Thesis: A Study of $T = 1$, $T = 3/2$, and $T = 2$ States in Some Light Nuclei Using (He^3, n) Reactions.
- David George Agresti (*Physics*). B.S., Ohio State University, 1959; M.S., California Institute of Technology, 1962.
Thesis: Nuclear Hyperfine Interactions in W^{182} , W^{183} , and Pt^{195} as Studied by the Mössbauer Effect.
- Irwin Emanuel Alber (*Aeronautics*). B.S., University of California (Los Angeles), 1962; M.S., California Institute of Technology, 1963.
Thesis: Integral Theory for Turbulent Base Flows at Subsonic and Supersonic Speeds.
- John Philip Andelin, Jr. (*Physics*). B.S., California Institute of Technology, 1955; M.S., Stanford University, 1956.
Thesis: Superfluid Drag in Helium II.
- Robert Carl Ashenfelter (*Physics*). B.S., Harvey Mudd College, 1961.
Thesis: Absolute Oscillator Strengths for Iron, Copper, Cadmium, and Gold Measured by the Atomic Beam Method.
- John David Atkinson (*Applied Mechanics and Mathematics*). B.Sc., University of Sidney, 1961; B.E. (Hons.), 1963.
Thesis: Spectral Density of First Order Piecewise Linear Systems Excited by White Noise.
- Andrew Dow Bacher (*Physics*). A.B., Harvard College, 1960.
Thesis: An Investigation of the Three-Body Reaction $\text{He}^3 (\text{He}^3, 2p) \text{He}^4$.
- Richard George Batt (*Aeronautics*). B.S.E., Princeton University, 1955; M.S., California Institute of Technology, 1958.
Thesis: Experimental Investigation of Hypersonic Wakes Behind Slender Two-Dimensional Bodies at $M_\infty = 6$.
- Thomas Robert Berger (*Mathematics*). B.S., Trinity College, 1963.
Thesis: Class Two p Groups as Fixed Point Free Automorphism Groups.
- Richard Clark Blish II (*Materials Science and Economics*). B.S., California Institute of Technology, 1963; M.S., 1964.
Thesis: Dislocation Velocity and Slip on the $\left\{ \begin{matrix} \bar{1} & 2 & \bar{1} & 2 \end{matrix} \right\} \left\langle \begin{matrix} 1 & \bar{2} & 1 & 3 \end{matrix} \right\rangle$ Systems of Zinc.
- Elliott Daniel Bloom (*Physics*). B.A., Pomona College, 1962.
Thesis: Polarization of Recoil Protons from the Photoproduction of Neutral Pions in Hydrogen Between 750 and 1450 MeV.
- Stanley Butman (*Electrical Engineering*). B.Eng. (Hons.), McGill University, 1960; S.M., Massachusetts Institute of Technology, 1962.
Thesis: Optimum Linear Coding for Additive Noise Systems Using Information Feedback.

DOCTOR OF PHILOSOPHY—*continued*

- John Irvin Castor (*Astronomy and Physics*). B.S., Fresno State College, 1961.
Thesis: Atmospheric Dynamics in a Model RR Lyrae Star.
- George Frederick Chapline, Jr. (*Physics*). B.A., University of California (Los Angeles), 1961.
Thesis: Bootstrap Theory and Certain Properties of the Hadron Axial Vector Current.
- Ronald Benjamin Chesler (*Physics*). A.B., University of Pennsylvania, 1961.
Thesis: Isotope Shift Measurements Using K X-Rays in Sn, Sm, and W.
- Carl Rudolph Clinesmith (*Physics*). B.S., University of Washington, 1959.
Thesis: π^0 Photoproduction from the Deuteron at Forward Angles in the Energy Range from 900 to 1400 MeV.
- Charles Lewis Cocke, Jr. (*Physics*). B.A., Haverford College, 1962.
Thesis: A Study of the ^9Be Nucleus.
- Donald Gerald Coyne (*Physics*). B.S., University of Kansas, 1958.
Thesis: Upper Limits on Neutral Associated Photoproduction Cross Sections.
- Lelia Mary Coyne (*Chemistry*). B.S., University of California (Los Angeles), 1961.
Thesis: Photosensitized cis-trans Isomerization of 2, 3-Diphenylbutene-2 and Investigation of Anomalous Sensitizers for Substituted Stilbene Isomerizations.
- Joseph Jay Dannenberg (*Chemistry*). A.B., Columbia College, 1962.
Thesis: I. Nuclear Magnetic Resonance Analysis of Ferrocenylcarbonium ion. 11. Ferrocene Catalyzed Photochemistry.
- Cary Nathan Davids (*Physics*). B.Sc. (Hons.), University of Alberta, 1961; M.Sc., 1962.
Thesis: An Experimental Study of a Stellar Neutron Sources: $^{13}\text{C}(\alpha, n)^{16}\text{O}$.
- John Randall Dickerson (*Applied Mechanics*). B.S., Illinois Institute of Technology, 1963; M.S., California Institute of Technology, 1964.
Thesis: Stability of Parametrically Excited Differential Equations.
- Andrew Dienes (*Physics and Electrical Engineering*). B. Eng., McGill University, 1962; M.S., California Institute of Technology, 1963.
Thesis: Nonlinear and Anisotropic Effects in Magnetically Tuned Laser Amplifiers.
- Alan Sander Dubin (*Chemistry*). Ch.E., University of Cincinnati, 1960.
Thesis: I. Nuclear Spin-Internal-Rotation Coupling.
II. Fluorine Spin-Rotation Interaction and Magnetic Shielding in Fluorobenzene.

DOCTOR OF PHILOSOPHY—*continued*

- Stanley Duane Ecklund (*Physics*). B.S., University of Minnesota, 1961.
Thesis: π^+ Photoproduction at Angles from 6° to 90° c.m. and Energies from 589 to 1269 MeV.
- Loh-Nien Fan (*Civil Engineering and Applied Mathematics*). B.S., National Taiwan University, 1961; M.S., California Institute of Technology, 1964.
Thesis: Turbulent Buoyant Jets into Stratified or Flowing Ambient Fluids.
- Gary Arnold Flandro (*Aeronautics*). B.S.M.E., University of Utah, 1957; M.S., California Institute of Technology, 1960.
Thesis: Rotating Flows in Acoustically Unstable Rocket Motors.
- Edward Berel Fomalont (*Astronomy and Physics*). B.S., University of Pennsylvania, 1961.
Thesis: The East-West Structure of Radio Sources at 1425 MHz.
- Gary Scott Fraley (*Physics*). B.S., California Institute of Technology, 1962.
Thesis: Supernovae Explosions Induced by Pair Production Instability.
- Lyman Jefferson Fretwell, Jr. (*Physics*). B.S., California Institute of Technology, 1956.
Thesis: Photoproduction of Charged Pion Pairs from Hydrogen at Energies up to 1500 MeV.
- Bing-Man Fung (*Chemistry and Physics*). B.S., Chung Chi College (Hong Kong), 1963.
Thesis: I. Study of Hydrogen Bonding by Infrared Spectroscopy and Nuclear Magnetic Resonance.
II. Electron Paramagnetic Resonance of Mn(II) Complexes in Acetonitrile.
- William Claude Galley (*Chemistry*). B.Sc., McGill University, 1962.
Thesis: Triplet Energy Delocalization in Polynucleotide-Acridine Complexes.
- Terry Randolph Galloway (*Chemical Engineering*). B.S., University of California, 1962; M.S., California Institute of Technology, 1963.
Thesis: A Study on the Mechanism of Molecular Transport With Systems of Gaseous Paraffins and of Convective Transport from Single Cylinders, Single Spheres, and Arrays of Spheres into Turbulently Flowing Streams.
- Melbourne Fernald Giberson (*Applied Mechanics and Business Economics*). B.S., University of Pennsylvania, 1963; M.S., California Institute of Technology, 1964.
Thesis: The Response of Multi-story Structures Subjected to Earthquake Excitation.
- Alexander Franklin Hermann Goetz (*Planetary Science*). B.S., California Institute of Technology, 1961; M.S., 1962.
Thesis: Infrared 8-13 Micron Spectroscopy of the Moon and Some Cold Silicate Powders.

DOCTOR OF PHILOSOPHY—*continued*

- David Reeves Goosman (*Physics*). B.A., Reed College, 1962.
Thesis: Nuclear Energy Levels of ^{87}K .
- William Franklin Greenman (*Materials Science and Economics*). B.S., California Institute of Technology, 1960; M.S., 1962.
Thesis: Dislocation Mobility in Pure Copper Single Crystals.
- Lawrence William Hallanger (*Applied Mechanics*). B.S., Harvey Mudd College, 1961; M.S., California Institute of Technology, 1962.
Thesis: The Dynamic Stability of an Unbalanced Mass Exciter.
- Kenneth Gunder Harstad (*Aeronautics*). B.S.M.E., University of North Dakota, 1961; S.M., Massachusetts Institute of Technology, 1962.
Thesis: Steady Laminar Compressible Magnetofluidynamic Gas Flows in Channels.
- Donald LeRoy Hartill (*Physics*). S.B., Massachusetts Institute of Technology, 1961.
Thesis: Experimental Study of Antiproton—Proton Annihilation Into an Electron—Positron Pair and Antiproton—Proton Annihilation Into Two γ —Rays for Incident Antiproton Momenta of 1.50 GeV/c and 2.50 GeV/c.
- G. Laurie Hatch (*Physics*). B.S., Tufts University, 1959.
Thesis: Neutral Meson Photoproduction From Hydrogen at Forward Angles in Photon Energy Range 750-1500 MeV.
- Michael George Hauser (*Physics*). B.E.Ph., Cornell University, 1962.
Thesis: Photoproduction of Charged Pion Pairs and $\text{N}^*(1238)^{++}$ in Hydrogen from 0.9 to 1.3 GEV.
- Mathilde Jeannette Hebb (*Physics*). A.B., Bryn Mawr College, 1961.
Thesis: Radiative Corrections to Neutrino-Electron Processes.
- Frank Stephen Henyey (*Physics*). A.B., University of California (Berkeley), 1963.
Thesis: Calculation of the $\text{N}^*(1238)$ Electromagnetic Mass Differences by S-Matrix Methods.
- Frederick Lee Hinton (*Physics*). B.S.E., University of Michigan, 1962; M.S., 1963.
Thesis: Collisionless Absorption and Emission of Electromagnetic Waves by Bounded Plasma.
- Alan Lowell Hoffman (*Aeronautics and Applied Mathematics*). B.E.Ph., Cornell University, 1963; M.S., California Institute of Technology, 1964.
Thesis: Magnetohydrodynamic Shock Production and Current Sheet Diffusion.
- Brian Mark Hoffman (*Chemistry*). B.S., University of Chicago, 1962.
Thesis: Interactions Between Molecules and Superconductors.

DOCTOR OF PHILOSOPHY—*continued*

- Arthur Thornton Hubbard (*Chemistry*). B.A., Westmont College, 1963.
Thesis: Electrochemistry in Thin Layers of Solution.
- Raul Husid (*Civil Engineering*). C.E., University of Chile, 1960; M.S., California Institute of Technology, 1964.
Thesis: Gravity Effects on the Earthquake Response of Yielding Structures.
- Martin Stanley Itzkowitz (*Chemistry and Physics*). A.B., Columbia College, 1962.
Thesis: A Theoretical Study of the Electron Spin Resonance Spectra of Nitroxide Free Radicals.
- Robert Tamotsu Iwamasa (*Chemistry*). B.S., University of California (Berkeley), 1959; M.A., University of California (Riverside), 1963.
Thesis: An Infrared and Proton Magnetic Resonance Study on the Polarization of Water and Methanol by Various Diamagnetic Salts in Aprotic Solvents.
- David Fielding James (*Mechanical Engineering*). B.Sc., Queen's University, 1962; M.S., California Institute of Technology, 1963.
Thesis: Laminar Flow of Dilute Polymer Solutions Around Circular Cylinders.
- Janet Gretchen Jones (*Chemistry*). B.A., Swarthmore College, 1961.
Thesis: Ligand Bridging in the Oxidation of Chromium(II) at Mercury Electrodes.
- David Kabat (*Biochemistry and Chemistry*). Sc.B., Brown University, 1962.
Thesis: I. Protein Synthesis During Chicken Erythrocyte Differentiation.
II. Studies of Ordered DNA • Protein Fibers.
- Regis Baker Kelly (*Biophysics and Chemistry*). B.Sc. (Hons.), Edinburgh University, 1961; Dipl. Bioph., 1961.
Thesis: The Replication of Bacteriophage MS2.
- Alan Frank Klein (*Aeronautics*). B.E.Ph., Cornell University, 1960; M.Ae.E., 1961.
Thesis: I. The Use of a Large Conventional Shock Tube as a Pre-Ionizer for an Inverse Pinch Shock Tube.
II. The Application of Thin-Film Heat Transfer Gauges and Flush Electrostatic Probes to Partially Ionized Flows in Shock Tubes.
- John Ling-Yee Lam (*Physics*). B.A., Rice University, 1962.
Thesis: Radiation of a Point Charge Moving Uniformly Over an Infinite Array of Conducting Half-Planes.
- George Lauer (*Chemistry*). B.S., University of California (Los Angeles), 1961.
Thesis: I. Characterization of Electrochemically Formed Surface Oxide Film on Platinum Electrodes.
II. Development of Electronic Electrochemical Control and Data Acquisition Instrumentation.

DOCTOR OF PHILOSOPHY—*continued*

- John Eldon Lewis (*Aeronautics and Applied Mathematics*). B.S., University of California, 1962; M.S., California Institute of Technology, 1963.
Thesis: Experimental Investigation of Supersonic, Laminar, Two-Dimensional, Boundary Layer Separation in a Compression Corner with and without Cooling.
- Chien-Shih Lu (*Chemical Engineering*). B.S., National Taiwan University, 1956; M.S., University of Houston, 1962.
Thesis: A Thermodynamic Study of Multiple Reaction Systems at and Near Equilibrium.
- Loren Daniel Lutes (*Applied Mechanics and Economics*). B.Sc., University of Nebraska, 1960; M.Sc., 1961.
Thesis: Stationary Random Response of Bilinear Hysteretic Systems.
- Ramani Mani (*Mechanical Engineering*). B.E., University of Bombay, 1963; M.S., California Institute of Technology, 1964.
Thesis: Quasi Two-Dimensional Flows Through Cascades.
- Franklin Lester Marshall (*Mechanical Engineering*). B.S., California Institute of Technology, 1962; M.S., 1963.
Thesis: I. Surface Deformations in a Draining Cylindrical Tank.
II. Stability of a Laminar Film on an Inclined Plane.
- John Wallace Matthews (*Electrical Engineering and Physics*). B.S., University of California (Los Angeles), 1962; M.S., California Institute of Technology, 1963.
Thesis: Theory of Holography.
- David James McCloskey (*Engineering Science and Applied Mathematics*). B.S., Stanford University, 1958; M.S., 1959.
Thesis: Multiple Scattering of Acoustical Waves.
- Stewart Douglas McDowell (*Geology*). B.S., Pennsylvania State University, 1960; M.S., California Institute of Technology, 1962.
Thesis: The Intrusive History of the Little Chief Granite Porphyry Stock, Panamint Range, California.
I. Structural Relationships.
II. Petrogenesis, Based on Microprobe Analyses of the Feldspars.
- Robert James McEliece (*Mathematics*). B.S., California Institute of Technology, 1964.
Thesis: Linear Recurring Sequences Over Finite Fields.
- Francis Guy Moses (*Chemistry*). B.A., University of Delaware, 1958.
Thesis: I. The Thermolysis of Acetyl Peroxide.
II. The Photosensitized Decomposition of Acetyl Peroxide in Solution.

DOCTOR OF PHILOSOPHY—*continued*

- Richard Stevens Naylor (*Geology*). S.B., Massachusetts Institute of Technology, 1961.
Thesis: A Field and Geochronologic Study of Mantled Gneiss Domes in Central New England.
- Navin Chandra Nigam (*Civil Engineering*). B.Sc., University of Allahabad, 1955; B.E., University of Roorkee, 1958; M.S., Purdue University, 1964.
Thesis: Inelastic Interactions in the Dynamic Response of Structures.
- Frederick Reyes Norwood (*Applied Mechanics*). B.S., University of California (Los Angeles), 1962; M.S., California Institute of Technology, 1963.
Thesis: Diffraction of Transient Elastic Waves by a Spherical Cavity.
- Carl E. Patton (*Electrical Engineering, Materials Science and Chemistry*). S.B., Massachusetts Institute of Technology, 1963; M.S., California Institute of Technology, 1964.
Thesis: Dynamic Processes in Magnetic Thin Films—Domain Wall Motion and Ferromagnetic Resonance.
- Harold James Payne (*Applied Mathematics*). B.S., Purdue University, 1963.
Thesis: Response of Nonlinear Systems to Stochastic Excitation.
- Joram Paul Piatigorsky (*Developmental Biology and Chemistry*). A.B., Harvard College, 1962.
Thesis: Studies on Nucleoside and Amino Acid Uptake and on RNA and Protein Synthesis by Growing Oocytes, Unfertilized and Fertilized Sea Urchin Eggs.
- Leonard William Piszkiwicz (*Chemistry*). B.S., Loyola University (Chicago), 1962.
Thesis: I. The Synthesis of Conformationally Stable Carbohydrates.
II. Studies on Synthetic Sesquiterpenes Related to Eremophilone.
- Robert Leslie Poeschel (*Electrical Engineering*). B.S., University of Illinois, 1960; M.S., 1960.
Thesis: A Nonlinear Study of Beam Plasma Amplification.
- David Peter Pope (*Materials Science*). B.S., University of Wisconsin, 1961; M.S., California Institute of Technology, 1962.
Thesis: The Mobility of Edge Dislocations in the Basal Slip System of Zinc.
- Thomas Charles Reihman (*Mechanical Engineering*). B.S., Iowa State University, 1961; M.S., University of Denver, 1963.
Thesis: Laminar Flow Over Transverse Rectangular Cavities.

DOCTOR OF PHILOSOPHY—*continued*

- Peter Paul Augustine Rispin (*Applied Mechanics*). B.Sc., University College (Cork), 1959; M.Sc., 1961.
Thesis: A Singular Perturbation Method for Non-Linear Water Waves Past an Obstacle.
- David Herbert Rogstad (*Physics*). B.S., California Institute of Technology, 1962; M.S., 1964.
Thesis: Rotation and Masses of Galaxies as Determined by Single Spacing Interferometry of 21 cm Hydrogen Emission.
- Richard Lawson Russell (*Genetics and Chemistry*). A.B., Harvard College, 1962.
Thesis: Speciation Among the T-even Bacteriophages.
- Samuel Marvin Savin (*Geochemistry and Geology*). B.A., Colgate University, 1961.
Thesis: Oxygen and Hydrogen Isotope Ratios in Sedimentary Rocks and Minerals.
- Donald Emil Schmidt, Jr. (*Chemistry*). B.S., Iowa State University, 1963.
Thesis: I. Secondary Isotope Effects on the Reaction Catalyzed by the Enzyme Fumarase.
II. Salt Effects on the Enzyme Fumarase.
- Sang Chul Shim (*Chemistry*). B.S., Seoul National University, 1962.
Thesis: I. Photochemical *Cis* \rightleftharpoons *Trans* Isomerization of β -Styrylnaphthalene.
II. Photochemistry of N-Methyl-4-pyridone and N-Methyllutidone.
- Jerome Allan Smith (*Aeronautics*). B.S.E., University of Michigan, 1962; M.S., California Institute of Technology, 1963.
Thesis: An experimental Investigation of Reflecting, Ionizing Shocks in Xenon.
- Edmund Eugene Spaeth (*Applied Mechanics*). B.S., Stanford University, 1962; M.S., California Institute of Technology, 1963.
Thesis: The Convective Diffusion of Oxygen, Carbon Dioxide and Inert Gas in Blood.
- Robert John Spiger (*Physics*). B.S., University of Washington, 1962.
Thesis: An Investigation of the Compound Nuclei ${}^7\text{Li}$ and ${}^7\text{Be}$.
- Robert Grandin Stokstad (*Physics*). B.S., Yale University, 1962.
Thesis: The Measurement of Static Electric Quadrupole Moments of Excited Nuclear States of Coulomb Excitation.
- James Henry Strauss, Jr. (*Biochemistry and Biophysics*). B.S., Saint Mary's University, 1960.
Thesis: Studies on the RNA of Bacteriophage MS2.

DOCTOR OF PHILOSOPHY—*continued*

- Bob Hiro Suzuki (*Aeronautics*). B.S., University of California (Berkeley), 1960; M.S., 1962.
Thesis: Magnetofluid-Dynamic Drag Measurements on Semi-Infinite Bodies in Aligned Fields.
- Ivo Tammaru (*Physics*). B.S., California Institute of Technology, 1959.
Thesis: An Investigation of Spontaneous Breakdown of SU(3) Symmetry in the System of Pseudoscalar Meson and Baryon Octets.
- Henry Archer Thiessen (*Physics and Economics*). B.S., California Institute of Technology, 1961; M.S., 1962.
Thesis: π^+ Photoproduction at Angles from 50° to 165° C.M. and Energies from 500 to 1350 MeV.
- Nora Sigrun Thornber (*Physics and Applied Mathematics*). B.A., University of California (Riverside), 1962.
Thesis: Calculation of πNN and πNN^* Coupling Shifts, Using the Dashen-Frautschi Method.
- John Michael Trischuk (*Physics*). B.E., McGill University, 1961.
Thesis: Nuclear Beta Spectroscopy Using Solid State Detectors.
- Dorothy Yung-Hsun Tuan (*Biochemistry*). S.B., National Taiwan University, 1962.
Thesis: I. Interaction of DNA and Histone in Native Nucleohistone.
II. Dormancy Associated with the Repression of Genetic Activity.
- Thomas Janney Tyson (*Aeronautics*). B.S., California Institute of Technology, 1954; M.S., University of California, 1958.
Thesis: Laminar Boundary Layers in the Neighborhood of Rapid Spatial Changes.
- Lorin Lee Vant-Hull (*Physics*). B.S., University of Minnesota, 1954; M.S., University of California (Los Angeles), 1956.
Thesis: Verification of Long Range Quantum Phase Coherence in Superconducting Tin Utilizing Electromagnetically Stabilized Josephson Junctions.
- Myles Alexander Walsh III (*Aeronautics*). A.B., Harvard College, 1963; M.S., California Institute of Technology, 1964.
Thesis: On the Turbulent Flow of Dilute Polymer Solutions.
- Charles Chang-Ping Wang (*Aeronautics*). B.S., National Taiwan University, 1959; M.S., National Tsing Hua University, 1961; M.S., California Institute of Technology, 1963.
Thesis: Mass Spectrometric Studies of Ionization in Shock Heated Gas Mixtures.

DOCTOR OF PHILOSOPHY—*continued*

- Edmund John Weber (*Physics and Economics*). B.Eng., McGill University, 1963; M.S., California Institute of Technology, 1965.
Thesis: The Solar Wind and its Angular Momentum.
- Robert William Weinman (*Physics*). B.E.Ph., Cornell University, 1960.
Thesis: An Isobar Model of Nucleon Compton Scattering.
- Pieter Wesseling (*Aeronautics and Applied Mathematics*). Ing., Technological University of Delft, 1964.
Thesis: The Driving Mechanism of Strongly Developed Taylor Vortex Flow.
- James Gerard Wetmur (*Chemistry*). B.S., Yale University, 1963.
Thesis: Studies on the Kinetics of Renaturation of DNA.
- Stephen Andrew Williams (*Mathematics*). B.S., Illinois Institute of Technology, 1964.
Thesis: On the Cesari Fixed Point Method in a Banach Space.
- Arvel Benjamin Witte (*Aeronautics*). B.Sc., University of Nebraska, 1957; M.Sc., 1959.
Thesis: I. Experimental Investigation of an Arc-Heated Supersonic Free Jet.
II. Analysis of One-dimensional Isentropic Flow for Partially Ionized Argon.
- David Clark Wooten (*Applied Mechanics and Physics*). B.A., Rice University, 1960; M.S., 1962.
Thesis: I. The Attenuation and Dispersion of Sound in a Condensing Medium.
II. The Flow of a Gas-Particle Mixture Downstream of a Normal Shock in a Nozzle.
- Elton Theodore Young II (*Biophysics and Genetics*). B.A., University of Colorado, 1962.
Thesis: Structure and Synthesis of Bacteriophage Lambda DNA.
- Clyde Stewart Zaidins (*Physics*). B.S., California Institute of Technology, 1961; M.S., 1963.
Thesis: A Study of the Reaction ${}^6\text{Li}({}^{12}\text{C},\text{d}){}^{16}\text{O}^*$ Above the Coulomb Barrier.
- Tse-Fou Zien (*Aeronautics*). B.S., National Taiwan University, 1958; M.S., Brown University, 1963.
Thesis: A Class of Three-Dimensional Optimum Wings in Hypersonic Flow.
- Laurence Bei-yu Zung (*Engineering Science*). B.Sc., Purdue University, 1962; M.S., California Institute of Technology, 1963.
Thesis: Particle Fluid Mechanics in Shear Flows, Acoustic Waves, and Shock Waves.

Prizes and Awards

GEORGE W. GREEN MEMORIAL AWARD

Awarded to the undergraduate student who, in the opinion of the Division Chairmen, has shown outstanding ability and achievement in the field of creative scholarship.

(Recipient to be announced)

FREDERIC W. HINRICHS, JR., MEMORIAL AWARD

Awarded 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.

(Recipient to be announced)