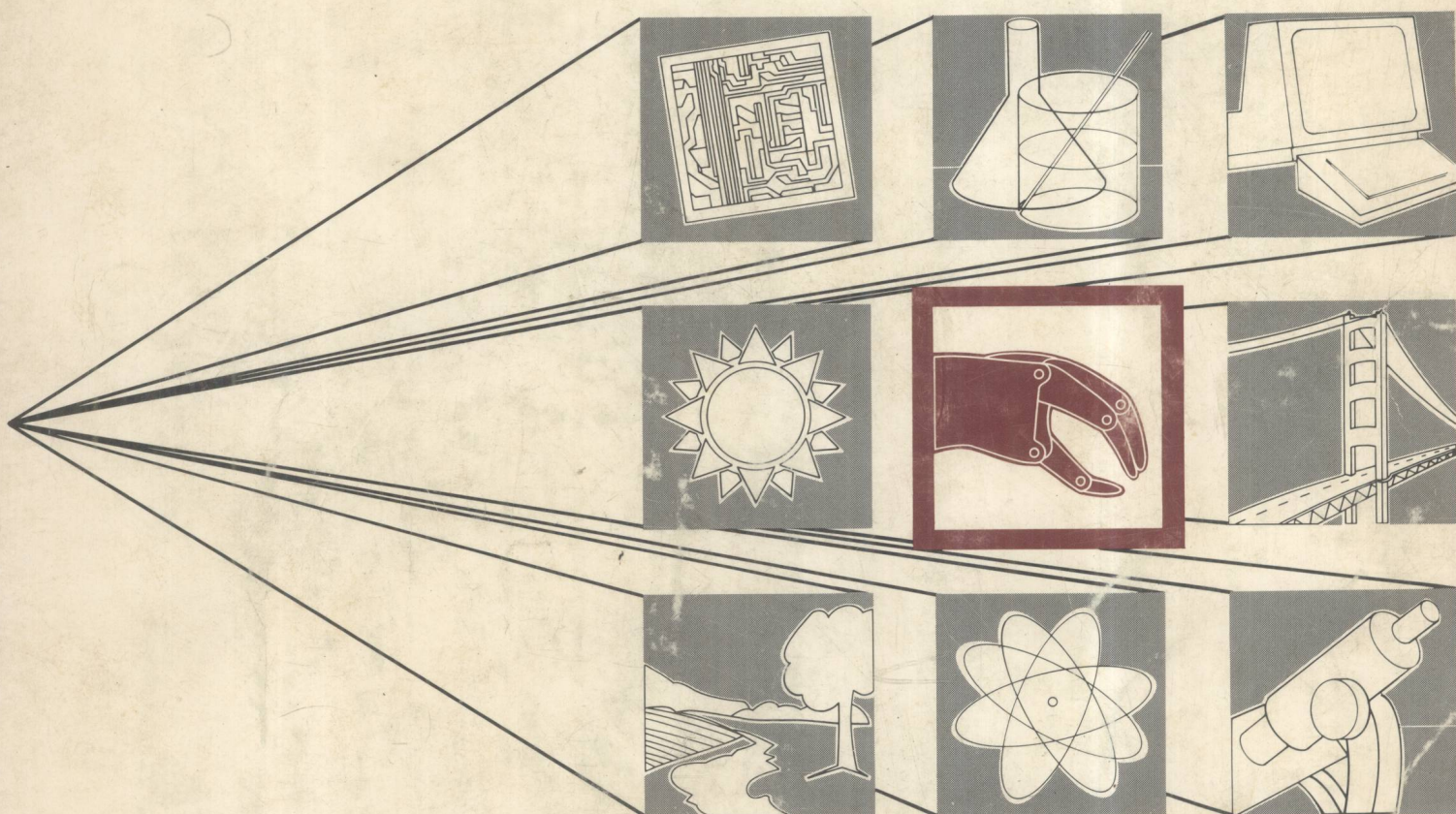


The Directory of Consultants in

Robotics & Mechanics



1st Edition

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The Directory of CONSULTANTS in ROBOTICS AND MECHANICS



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1st Edition

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8664644 Introduction

Innovations in automation technology compel manufacturing executives to make attendant transformations in the production industry. The introduction of robotics to manufacturing, for instance, has affected material handling, welding, assembly, and painting or finishing departments. The integration of robotics and advanced mechanics with industry is an imposing project, however, and the modification of an operation is often confined to the knowledge and experience of existing personnel. As a result, consultants in robotics and mechanics have become increasingly important to the installation and maintenance of modern and productive facilities.

The DIRECTORY OF CONSULTANTS IN ROBOTICS AND MECHANICS is an important resource for those involved in the application of technology to industry. The 1,958 consultants included in this directory were selected from WHO'S WHO IN TECHNOLOGY TODAY, the most comprehensive biographical reference of the leading scientists and technologists in North America. This selection was based upon each biographee's self-designation as a consultant. The biographical data in each listing has been carefully reviewed by the editors to ensure the highest caliber representation.

Consideration of professional credentials is a key ingredient in maintaining a high-quality and useful biographical publication; however, a logical, well-organized format is also necessary for the quickest access to that information. The DIRECTORY OF CONSULTANTS IN ROBOTICS AND MECHANICS is divided into three sections — Section One, containing biographical profiles of the consultants; Section Two, the Expertise Index; and Section Three, an Index of Names.

Biographical Data

Biographical data is organized by state headings within several designated categories of expertise. The names of consultants specializing in that field are listed alphabetically beneath state subheadings to facilitate access to consultants available within a given geographic area.

Most listings include **name, telephone number, present position, address, and expertise. Past affiliations, education, publications, books, patents, achievements, societies, and honors/awards** are added for further consideration.

Expertise Index

The DIRECTORY OF CONSULTANTS IN ROBOTICS AND MECHANICS is unique in its approach to indexing. Rather than using generic expertise categories, the Expertise Index of this directory is compiled using the exact phraseology employed by the consultants to describe their own areas of technical specialty. The result is an index of greater dimension and more accurate descriptions. In many instances, consultants have multiple areas of expertise which can be cross-referenced, thus allowing readers to determine precisely those with very specific or diverse technical knowledge.

Location is an important consideration, for it may be advantageous to retain a consultant who resides nearby. The alphabetical city/state arrangement within the Expertise Index allows a reader to immediately refer to the desired locale.

Index of Names

For readers who know the name of a prospective consultant but need additional information, an alphabetical Index of Names completes the directory. The number to the right of each entry in this index refers to the page number where the complete biographical profile appears in Section One.

Publishing The DIRECTORY OF CONSULTANTS IN ROBOTICS AND MECHANICS will be a continual challenge because of the ever-changing nature of science and technology. As new and different facets evolve, new individuals will surface as consultants in those areas. The editors welcome suggestions for additions to the directory and encourage consultants, or anyone wishing to nominate consultants for inclusion in the data bank, to write to J. Dick Publishing, Division of Research Publications, 801 Greenbay Road, Lake Bluff, Illinois 60044.

To locate the leaders of this technological evolution will be an ongoing process, a constant search, and our goal for the future.

The Editors

Society Index

Society	Abbreviation	Society	Abbreviation
Accreditation Board for Engineering and Technology	ABET	Canadian Society for Chemical Engineering	CSCChE
Acoustical Society of America	AcSoc	Engineering Foundation	EF
Air Pollution Control Association	APCA	Engineering Index	EI
Alpha Pi Mu	AIIM	Engineering Institute of Canada	EIC
American Academy of Environmental Engineers	AAEE	Engineering Societies Library	ESL
American Association for the Advancement of Science	AAAS	Eta Kappa Nu	EKN
American Association of Cost Engineers	AACE	Fluid Power Society	FPS
American Association of Engineering Societies	AAES	The Geological Society of America, Inc.	GSA
American Association of Petroleum Geologists	AAPG	Illuminating Engineering Society of North America	IES
American Association of Physics Teachers	AAPT	Industrial Research Institute	IRI
American Bar Association	ABA	Institute of Electrical and Electronics Engineers	IEEE
American Chemical Society	ACS	Institute of Noise Control Engineering	INCE
American Concrete Institute	ACI	Institute of Transportation Engineers	ITE
American Congress on Surveying and Mapping	ACSM	Instrument Society of America	ISA
American Consulting Engineers Council	ACEC	International Material Management Society	IMMS
American Defense Preparedness Association	ADPA	International Solar Energy Society	ISES
American Dental Association	ADA	Iron and Steel Society of AIME	ISS-AIME
American Federation of Scientists	AFS	Math Association of America	MAA
American Foundrymen's Society	AFS	The Metallurgical Society of AIME	TMS-AIME
American Geophysical Union	AGU	National Academy of Engineering	NAE
American Institute of Aeronautics and Astronautics, Inc.	AIAA	National Academy of Sciences	NAS
American Institute of Chemical Engineers	AICHE	National Association of Corrosion Engineers	NACE
American Institute of Industrial Engineers, Inc.	AIIE	National Council of Engineering Examiners	NCEE
American Institute of Mining, Metallurgical & Petroleum Engineers	AIME	National Institute of Ceramic Engineers	NICE
American Institute of Petroleum Geologists	AIPG	National Research Council	NRC
American Institute of Physics	AIP	National Society of Professional Engineers	NSPE
American Institute of Plant Engineers	AIPE	North American Metalworking Research Institute	NAMRI
American Management Association	AMA	Operations Research Society of America	ORSA
American Math Association	AMA	Optical Society of America	OSA
American Medical Association	AMA	Phi Lambda Upsilon	ΦΛΥ
American National Standards Institute, Inc.	ANSI	Pi Tau Sigma	ΠΤΣ
American Nuclear Society	ANS	Sigma Xi, The Scientific Research Society	ΣΞ
American Physics Society	APS	Society for the Advancement of Material & Process Engineering	SAMPE
American Society for Engineering Education	ASEE	Society for Computer Simulation	SCS
American Society for Metals	ASM	Society for Experimental Stress Analysis	SESA
American Society of Naval Engineers	ASNE	Society for the History of Technology	SHOT
American Society for Quality Control	ASQC	Society of Allied Weight Engineers, Inc.	SAWE
American Society for Testing and Materials	ASTM	Society of American Military Engineers	SAME
American Society of Agricultural Engineers	ASAE	Society of American Value Engineers, Inc.	SAVE
American Society of Civil Engineers	ASCE	Society of Automotive Engineers, Inc.	SAE
American Society of Gas Engineers	ASGE	Society of Fire Protection Engineers	SFPE
American Society of Heating, Refrigerating & Air-Conditioning Engineers	ASHRAE	Society of Manufacturing Engineers	SME
American Society of Lubrication Engineers	ASLE	Society of Mining Engineers of AIME	SME-AIME
American Society of Mechanical Engineers	ASME	Society of Motion Picture and Television Engineers	SMPTTE
American Society for Nondestructive Testing	ASNT	Society of Naval Architects and Marine Engineers	SNAME
American Society of Photogrammetry	ASP	Society of Packaging and Handling Engineers	SPHE
American Society of Safety Engineers	ASSE	Society of Petroleum Engineers	SPE
American Water Works Association	AWWA	Society of Photographic Scientists and Engineers	SPSE
American Welding Society	AWS	Society of Photo-Optical Instrumentation Engineers	SPIE
Association for Computing Machinery, Inc.	ACM	Society of Plastics Engineers, Inc.	SPE
Association of Engineering Geologists	AEG	Society of Women Engineers	SWE
Association of Environmental Engineering Professors	AEEP	Standards Engineers Society	SES
Association of Scientists and Engineers of the Naval Sea Systems Command	ASE	Tau Beta Pi Association	TBPI
Audio Engineering Society, Inc.	AES	The Association of Graphic Arts	TAGA
Canadian Aeronautics and Space Institute	CASI	Technical Association of the Pulp and Paper Industry	TAPPI
Canadian Council of Professional Engineers	CCPE	Transportation Research Board	TRB
		United Engineering Trustees	UET
		Volunteers in Technical Assistance	VITA
		Water Pollution Control Federation	WPCF

Table of Abbreviations

The following abbreviations are frequently found in this directory.

AA Associate in Arts	Biomed biomedicine, biomedical	DNA deoxyribonucleic acid
AB Bachelor of Arts	Biophys biophysical, biophysics	DP data processing
Abstr abstract(s)	Bldg Building	DSc Doctor of Science
AC alternating current	Bldv Boulevard	
Acad academy, academic	BS Bachelor of Science	E East
Acoust acoustic(s), acoustical	BSAe (BSAE) Bachelor of Science in Aerospace	Ecol ecological, ecology
Admin administration, administrative	BSChe Bachelor of Science in Chemical Engineering	Ed Editor, edited, education
AEC Atomic Energy Commission	BSE Bachelor of Science in Engineering	EE Electrical Engineering, Electrical Engineer
Aerodyn aerodynamic(s),	BSEE Bachelor of Science in Electrical Engineering	EEG electroencephalogram, electroencephalography
Aeronaut aeronautic(s), aeronautical	BSME Bachelor of Science in Mechanical Engineering	EDP electronic data processing
Aerophys aerophysical, aerophysics	Bur Bureau	EKG electrocardiogram
Aerosp aerospace		Elec electric, electrical, electronic, electronics
AFB Air Force Base		Electrochem electrochemical, electrochemistry
Affil affiliate(s), affiliation		Electro-op electro-optical, electro-optics
Agr agricultural, agriculture		Electrophys electrophysical, electrophysics
Agron agronomic, agronomical, agronomy		Electrotech electrotechnical
AID Agency for International Development	CA California	Embryol embryologic, embryological, embryology
AK Alaska	CAD computer aided design	EMI electro-magnetic interference
AL Alabama	CAM computer aided manufacturing	Encycl encyclopedia
Alt alternate	Cardiol cardiology	Endocrinol endocrinologic, endocrinology
Am American, America	Cardiovasc cardiovascular	
AM Master of Arts	CATV cable TV	Engr engineer(s)
Anat anatomic, anatomical, anatomy	CCD charge coupled device	Engrg engineering
Appl applied	CEngr Corps of Engineers	Env environment(s), environmental
Apr April	Chpt Chapter	Enzym enzymology
Angiol angiology	Chem chemistry, chemical	Exp experimental, experiment
Aquacult aquaculture	Cir Circle	
AR Arkansas	Civ civil, civilian	FCC Federal Communications Commission
Archaeol archaeological, archaeology	Ckts circuits	Feb February
Archit architectural, architecture	CNC computer numerical control	Fed Federal
Assn Association	Co Company	Fermentol fermentology
Assoc Associate	CO Colorado	FL Florida
Asst Assistant	Coll College	Found foundation, founded
Astrodyn astrodynamics	Commun Communication(s)	
Astron astronomical, astronautics, astronomy	Comp computer	GA Georgia
Astrophys astrophysical, astrophysics	Compon component(s)	Gastroenterol gastroenterological, gastroenterology
	Conf conference	Geneal genealogical, genealogy
Audiol audiology	Conserv conservation, conservatory	Geod geodesy, geodetic
Aug August	Consult consult, consultant(s), consultation, consulting	Geog geographic, geographical, geography
Auth author	Corp Corporation	Geol geologic, geological, geology
AV audiovisual	Cryog cryogenic(s)	Geomorphol geomorphologic, geomorphology
Ave Avenue	Crystallog crystallographic, crystallographical, crystallography	Geophys geophysical, geophysics
AZ Arizona	CT Connecticut	Glaciol glaciology
	Cybernet cybernetic(s)	Govt government
B Bachelor (academic degrees)	Cytol cytological, cytology	Guid guidance
BA Bachelor of Arts		
BASC Bachelor of Arts and Sciences	D Doctor (academic degrees)	HI Hawaii
BBA Bachelor of Business Administration	DC District of Columbia	Hist history
BCE, BChE, (BCHE) Bachelor of Chemical Engineering	DDC direct digital control	Hon honorary
	DE Doctor of Engineering	Hort horticultural, horticulture
Bd Board	DE Delaware	
BE Bachelor of Engineering	Dec December	
BEE Bachelor of Electrical Engineering	DEE Doctor of Electrical Engineering	
Biochem biochemistry, biochemical	Dev development, developed	
Bioengrg bioengineering	DHL Doctor of Humane Letters	
	Dir Director	

Hwy Highway
Hydraul hydraulic(s)
Hydrodyn hydrodynamic(s)
Hydrol hydrologic, hydrological, hydrology

IA Iowa
ID Idaho
IL Illinois
Immunol Immunologic, Immunological Immunology

IN Indiana
Inc Incorporated
Incl included, including
Indust industrial, industries, industry
Info information
Ing engineer
Inorg inorganic
Inst institute(s), institution(s)
Instr instrument(s)
Intl International
IR infrared radiation
Irrig irrigation

Jan January
Jct junction
JD Juris Doctor
Jr Junior
Jul July
Jun June

KS Kansas
KY Kentucky

LA Louisiana
Lab Laboratory(ies)
Limnol limnological, limnology
LLB Bachelor of Laws
LLD Doctor of Laws
LLW Master of Laws
Ln Lane
LSI large-scale integrated circuit

MA Master of Arts
MA Massachusetts
Mach machine(s), machinery
Mar March
MASc Master of Arts and Sciences
MASE Master of Science in Aerospace
Math mathematics, mathematical
MBA Master of Business Administration
MD Doctor of Medicine
MD Maryland
ME Maine
Mech mechanical
Med medical, medicine
MEE Master of Electrical Engineering
Metall metallurgic, metallurgical, metallurgy
Metallog metallographic, metallography
Metaphys metaphysical, metaphysics
Meteorol meteorological, meteorology
Metrol metrological, metrology
Mgmt management
Mgr manager
MHD magnetohydrodynamics

MI Michigan
Microbiol microbiological, microbiology
Microcomp microcomputer(s)
Micros microscopic, microscopical, microscopy
Microsys microsystem(s)
Mineral mineralogical, mineralogy
MN Minnesota
MO Missouri
MS Master of Science
MS Mississippi
MSAe Master of Science in Aerospace
MSc Master of Science
MScEE Master of Science in Electrical Engineering
MOS metal oxide semiconductor(s)
MSChE Master of Science in Chemical Engineering
MSE Master of Science in Engineering
MT Montana
Mycol mycologic, mycology

N North
Nat Natural
NASA National Aeronautics & Space Administration
Natl National
Navig navigation(al)
NC North Carolina
ND North Dakota
NE Nebraska
Neurol neurological, neurology
NH New Hampshire
NJ New Jersey
NM New Mexico
NMR nuclear magnetic resonance
Nov November
NSF National Science Foundation
Nucl Nuclear
NV Nevada
NY New York

Observ observatories, observatory
Ocean oceanographic, oceanographical oceanography
OCR optical character recognition
Oct October
OH Ohio
OK Oklahoma
Oncol oncologic, oncology
Opto-elec Optoelectronic(s)
OR Oregon
Org organic
Otol otological, otology

PA Pennsylvania
Paleobot paleobotanical, paleobotany
Paleont paleontological, paleontology
Parasitol parasitology
Path pathologic, pathological, pathology
Petrol petroleum, petrologic, petrological, petrology
PhB Bachelor of Philosophy
PhD Doctor of Philosophy
Pharmaceut pharmaceutical(s), pharmaceutical(s)

Pharmacol pharmacologic, pharmacological, pharmacology
Photo-op photo-optical
Photom photometric, photometrical photometry
Phys Physics, physical
Pl place
Prod product
Prof professor
Prgm program
Proj project
Prov province
PVC polyvinyl chloride

Radiol radiological, radiology
Rep republic, representative
RF radio frequency
RI Rhode Island
Rsch research
Rvw review

S South
Sanit sanitary, sanitation
SB Bachelor of Science
SC South Carolina
ScB Bachelor of Science
ScD Doctor of Science
Sci science(s), scientific
SD South Dakota
Seismog seismograph, seismographic, seismography

Seismol seismological, seismology
Semicon semiconductor
Sep September
SM Master of Science
SMEE Master of Science in Electrical Engineering
Soc society
Sr senior
St Street
Stat statistics
Ste Suite
Struct structural, structure(s)
Sys system(s), systematic(s) systematical

Tech technical, technology
Telecommun telecommunications
Thermodyn thermodynamic(s)
TN Tennessee
Topog Topographic, topographical topography
TX Texas

Univ University
UT Utah

VA Virginia
Viol virological, virology
VLSI very large scale integrated circuit(s)
Vol volume
VT Vermont

W West
W/ with
WA Washington
WI Wisconsin
WV West Virginia
WY Wyoming

Zool zoological, zoology

How to Use the Expertise Index

Biographical profiles contain a Principal Expertise category in which consultants describe their primary area(s) of technical specialization. To create the index, over 1500 technical words are compared to this expertise field. When a match is made, the consultant's name, profile page, and city/state are listed next to the principal expertise phrase under the keyword heading. City/state is alphabetized so that readers can scan for location within keyword headings.

Consultants may include multiple expertise phrases in their profiles.

Example:

Under the Keyword Heading "**Ultrasound**" are the names and locations of individuals who have expertise in various aspects of Ultrasound.

Specific entries pertaining to the Keyword

ULTRASOUND					
BIOMEDICAL ULTRASOUND	Carstensen, E.,	(Pg 51)	Jerome, AZ		
BIOMEDICAL ULTRASOUND	Shung, K.,	(Pg 184)	Anaheim, CA		
BIOPHYSICS OF ULTRASOUND	Schwan, H.,	(Pg 175)	Concord, CA		
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COMPUTER CONTROL					
OF IMAGING ULTRASOUND	Kwolek, J.,	(Pg. 192)	Sunnyvale, CA		
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EXPERIMENTAL ULTRASONICS	Brown, A.,	(Pg 264)	Lilburn, GA		
EXPERIMENTAL ULTRASOUND	Blessing, G.,	(Pg 271)	Chicago, IL		
HIGH POWER ULTRASONIC					
ENERGY APPLICATION	Fairbanks, H.,	(Pg 273)	Chicago, IL		
MEDICAL ULTRASOUND	Smith, H.,	(Pg 275)	Springfield, IL		
MEDICAL ULTRASOUND	Hansell, S.,	(Pg. 290)	New York, NY		

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MECHANICAL ENGINEERING

ALABAMA

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ALABAMA—Cont.

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Schaeztle, Walter J. (Dr)

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Professor, Mechanical Engineering, University of Alabama, Drawer ME University, AL 35486. **EXPERTISE:** *HVAC, Thermal Energy Storage.* **PAST AFFILIATIONS:** Prof. & Head, Mech. Engrg. Dept., Univ. of Petroleum & Minerals, Dhahran, Saudi Arabia, 1969-71; Engr., Propulsion & Nuclear, McDonnell Douglas, St. Louis, Mo. 1958-62. **EDUCATION:** D.Sc., Mech. Engrg., Wash. Univ., 1962; M.S., Mech. Engrg., Carnegie-Mellon Univ., 1958; B.S., Mech. Engrg., Carnegie-Mellon Univ., 1957. **PUBLICATIONS:** 30 primarily in Energy Storage in Aquifers, Heating & Cooling Systems, Heat Pump Systems, Thermodynamics, Fluids, Energy in General, Solar Energy. **Books:** Author of 1. Most significant book, "The Design & Application of Thermal Energy Storage Systems in Aquifers", Pergamon Press. **PATENTS:** 3. **ACHIEVEMENTS:** Developing Jet Propulsion System; Developing Heating & Cooling Systems. **ORGANIZATIONS:** ASME, ASHRAE, ASEE, ISES, ASISES.

Turnquist, Paul K. (Dr)

(205) 826-4180

Professor & Head, Agricultural Engrg., Auburn University, Auburn, AL 36830. **PAST AFFILIATIONS:** Prof. Ag. Engrg. Dept., South Dakota State Univ., 1964-76; Asst. Prof., Oklahoma State Univ., 1958-62; Research Engr. Caterpillar Tractor, 1957. **EDUCATION:** Ph.D., Ag. Engrg., Oklahoma State Univ., 1965; M.S., Ag. Engrg., Oklahoma State Univ., 1961; B.S., Ag. Engrg., Kansas State Univ., 1957. **PUBLICATIONS:** 40 primarily in Power and Machinery. **Books:** Co-author of 1. "Tractors and Their Power Units", John Wiley, 1979. **ACHIEVEMENTS:** Educator and Administrator. **ORGANIZATIONS:** Am Soc of Agr. Engrg.; ASEE; NSPE; Alabama Soc of Prof. Engrgs.; Sigma Xi; Council of Forest Engrgs., ASEE Outstanding Young Faculty Award, 1970; A.W. Farrall Young Educator Award ASME, 1972; ASEE Ford Foundation Engrg Residence at Caterpillar Tractor Co., 1970-71.

ALASKA

Betz, Robert K. (Dr)

(907) 452-2372

President, Betz & Co., Inc., 801 Barnette St., Fairbanks, AK 99701. **EXPERTISE:** *Energy conservation heating, Ventilation and air conditioning.* **PAST AFFILIATIONS:** Owner - Construction Services of Alaska 1965-1981. **EDUCATION:** B.S.C.E., Univ. of AK, 1965. **PUBLICATIONS:** 10 primarily in Civil Engrg., Heating, Ventilation. **ORGANIZATIONS:** ASCE, ASHRAE.

ARIZONA

Bachus, Benson F. (Dr)

(602) 233-5191

Senior Staff Engineer, AT&T Network Systems Inc., 5229 N. 43 St., Phoenix, AZ 85018. **EXPERTISE:** *Wire and Cable for Telephone Facilities, Manufacturing Facility and methods.* **PAST AFFILIATIONS:** Product Engineering Mgr., Century Electronics, 1956-60; Western Electric Co., Senior Engineer, 1943-56; Naval Ordnance Research, 1942-43. **EDUCATION:** MBA, Creighton Univ, 1967; BSME, Kansas State Univ, 1942; Eng. Graduate Work, Ohio State Univ, 1963. **PATENTS:** 8 concerning Mfg. equip. for wire insulating - Method of Making Cellular Articles, 1967. **ACHIEVEMENTS:** Registered Professional Engineer in IL, NE, and AZ by examination; Developed foam insulated wire; In-plant coloring of polyethylene plastic; Elected Westchester, Illinois Trustee, 1950; Editor, ASPE Mag., 1970-. **ORGANIZATIONS:** ASME; Arizona Council Engineers and Scientists (ACESA), Treasurer, 1983-. **SPE, AMA; Western Electric Pioneer Club; Western Electric Science Club. HONORS/AWARDS:** 1979 Eng. of Year in Indus., Arizona SPE; 1980 ASME Centennial Medallion; 1943 N.O.L. Service Award, Navy Dept.; 1973-Chairman of Energy Conservation Committee, AT&T Network Systems Inc.

Biddle, Walter A. (Dr)

(602) 263-0561

V.P., Triandria Design Group, Inc., 844 E. Highland, Phoenix, AZ 85014. **EXPERTISE:** *Air conditioning, Plumbing, Fire protection.* **PAST AFFILIATIONS:** V.P., Engrg., Dorsett Ind., Inc., 1976-80; Principal, Biddle & Young Consulting Engrs., Inc., 1958-76. **EDUCATION:** B.S.M.E., Univ. of New Mexico, 1937. **ACHIEVEMENTS:** Design of air-conditioning systems, Grady Gammage Auditorium, Arizona State Univ. **ORGANIZATIONS:** Life Member, NSPE, ASME; Fellow, ASHRAE. **HONORS/AWARDS:** Fellow, ASHRAE, 1975.

Chen, Chuan F. (Dr)

(602) 621-4254

Head, Dept. of Aerospace & Mechanical Engrg, Univ of Arizona, Tucson, AZ 85721. **EXPERTISE:** *Fluid dynamics. Hydrodynamic stability, Double-diffusive convection.* **PAST AFFILIATIONS:** Chairman, Mech., Ind., & Aero. Engrg., Rutgers Univ, 1963-1980. **EDUCATION:** Ph.D., Brown Univ, 1960. **PUBLICATIONS:** 47 primarily in fluid dynamics. **Books:** Editor of 1. **ACHIEVEMENTS:** Contribution to the understanding of double-diffusive phenomenon. **ORGANIZATIONS:** Assoc. Fellow, AIAA; Member - ASME, APS, ASEE, AAAS. **HONORS/AWARDS:** Sr. Visitor, DAMTP, Cambridge Univ, 1971-72; Visiting Fellow, Research School of Earth Sciences, Australia National Univ, Canberra, Summer, 1978.

Conta, Lewis D. (Dr)

(602) 625-2732

Consultant and Adjunct Prof., Univ. of AZ, 915 La Huerta, Green Valley, AZ 85614. **EXPERTISE:** *Energy Conversion and Conservation, Thermodynamics, Internal Combustion Engines.* **PAST AFFILIATIONS:** Engr. in Residence, Engr. Soc. Commission on Energy, Washington, DC, 1978-80; Dean of Engr. & Prof. of Mech. Engrg., Univ. of RI, 1969-78. **EDUCATION:** Ph.D., Cornell Univ., 1942; M.S., 1935; B.S., 1934, Univ. of Rochester. **PUBLICATIONS:** 20 primarily in Combustion; Internal Comb. Engines; Energy Conversion & Conservation. **PATENTS:** 2 concerning Combustion stability - "Flashback Proof Oxy-Acetylene Mixer", 1948. **ACHIEVEMENTS:** Res. on the stratified operation of spark ignition engines; developments in stabilizing large multidex oxy-acetylene mixers & burners. **ORGANIZATIONS:** ASME; Vice Pres. for Res., 1981-83; Vice Pres. Region III, 1967-69; Exec. Committee & Chmn., Diesel & Gas Engine Power Div., 1969-74; ASEE; NSPE. **HONORS/AWARDS:** ASME Diesel & Gas Engine Power Award for Outstanding Paper, 1973; Freeman Award for Outstanding Achievement, Providence Engr. Soc., 1974; ASME Diesel & Gas Engine Power Citation for Outstanding Svc., 1980; ASME Centennial Medallion, 1980; ASME Life Fellow, 1983.

Cunningham, Richard G. (Dr)

Senior Patent Associate, Research Corporation, 6840 East Broadway Blvd., Tucson, AZ 85710. **EXPERTISE:** *Fluid mechanics, Two-phase flow, Jet pumps, Theory and design.* **PAST AFFILIATIONS:** V.P., Rsch. and Grad. Studies, Penn. State Univ., 1972-84; Prof. and Head Dept. of Mech. Engrg. PSU, 1962-1971. **EDUCATION:** Ph.D., Northwestern Univ, The Technological Instit., 1950. **PUBLICATIONS:** 28 primarily in fluid mechanics, lubrication, engrg education. **PATENTS:** 3 concerning lubricants, & lubrication system - "Additive Lubricants", circa, 1958. **ACHIEVEMENTS:** Research and publications on liquid-liquid and liquid-jet gas compression jet pumps, theory and experimental confirmations. **ORGANIZATIONS:** VP, ECPD, 1976-78, Pres, 1978-80 (name changed from ECPD to ABET), BOD (ECPD), 1969-75; ASME Policy Bd., Educ., 1967-76, & VP Educ., 1974-76. **HONORS/AWARDS:** 1983 ABET Linton E. Grinter Award for Disting. Service; 1974 ASME Moody Award for fluids engrg paper; 1974 ASME Central Pa. Section "Outstanding Mechanical Engr" Award.

Davidson, Joseph K. (Dr)

Professor, Dept. of Mechanical Engrg, Arizona State Univ, Tempe, AZ 85287. **EXPERTISE:** *Kinematics & Dynamics of Machinery, Vibrations, Mechanical Design, Failure Analysis & Prevention, Machine Elements.* **PAST AFFILIATIONS:** Asst. Prof., Ohio State Univ, 1965-73; The Gleason Works, Res. Proj. Engr., 1972-73 Academic Year (Study Leave); Assoc. Prof., Arizona State Univ, 1973-78. **EDUCATION:** Ph.D., Mech. Engr., Ohio State Univ, 1965; MSE, Mech. Engr., Ohio State Univ, BME, Mech. Engr., Ohio State Univ, 1960. **PUBLICATIONS:** 6 primarily in Mechanical Engrg. **ACHIEVEMENTS:** Educator. **ORGANIZATIONS:** ASME, ASEE, Sigma Xi, ASM. **HONORS/AWARDS:** NSF U.S.-Australia Cooperative Res. Grant, 1980.

Kinney, Robert B. (Prof)

(602) 621-6114

Professor, Aerospace & Mechanical Engineering, University of Arizona, Tucson, AZ 85721. **EXPERTISE:** *Viscous Fluid Flows, Laminar and Turbulent Flows with Heat Transfer, Numerical Analysis of Partial Differential Equations.* **PAST AFFILIATIONS:** Sr Rsch Engr, United Aircraft Corp, 1965-68. **EDUCATION:** Ph.D., Mech Engr, Univ of Minn, 1965; MS, Mech Engr, Univ of Calif, Berkeley, 1961; BS, Mech Engr, Univ of Calif, 1959. **PUBLICATIONS:** 20 primarily in fluid mechanics, heat transfer, computation methods. **ACHIEVEMENTS:** Devel a new method for analyzing unsteady viscous fluid flows; appl include external aerodynamics & internal flows. **ORGANIZATIONS:** Amer Inst for Aeronautics & Astronautics, Assoc Fellow; Amer Soc of Mech Engrs; AAAS, Fellow. **HONORS/AWARDS:** Forschungsstipendium, Rsch Fellow, Alexander von Humboldt Found, Bonn, West Germany.

Metzger, Darryl E. (Dr)

(602) 965-3291

Chairman, Mech. and Aerospace Engrg Dept, Arizona State Univ, Tempe, AZ 85281. **EXPERTISE:** *Heat Transfer, Fluid Mechanics, Thermal System Design, Energy Systems.* **PAST AFFILIATIONS:** Professor, Mech. Engr. Dept., Arizona State Univ, 1970-Present; Assoc. Prof., Mech. Engr. Dept., Arizona State Univ, 1967-70. Asst. Prof., 1963-67. **EDUCATION:** Ph.D., Mech. Engr., 1964; M.S., 1960; B.S., Mech. Engrg., Stanford Univ, 1959. **PUBLICATIONS:** 100 primarily in Heat Transfer, Fluid Mechanics. **Books:** Editor of 2. **ACHIEVEMENTS:** Principal Investigator & Industry Consultant on Numerous Projects Dealing With Dev. of High Temp. Engines & Engine Cooling Technology. **ORGANIZATIONS:** Am. Soc. Mech. Engr., AIAA, Sigma Xi. **HONORS/AWARDS:** NSF Fellow, Ford Foundation Fellow, NASA-ASEE Fellow, Assoc. Fellow AIAA.

Parker, Frank W. (Dr)

Principal, P & R Reconstructions, 5747 W Missouri, Apt. 31, Glendale, AZ 85301. **EXPERTISE:** *Mechanical engineering, Theoretical and applied mechanics, Consulting engineering, Accident engineering.* **PAST AFFILIATIONS:** Also, Police Officer, Ariz Pub Safety Dept. **EDUCATION:** BSME, New Mexico State University, 1971. **ORGANIZATIONS:** Soc Automotive Engrs, ASME.

ARIZONA—Cont.

Pennington, Neal A. (Dr) (602) 325-8068

President, Test Lab Annex, 1402 N. Swan Rd., Tucson, AZ 85712. **EXPERTISE:** *Air Conditioning and Heat Transfer, Solar Thermal Electric Power Generation, Photovoltaics, Wind and Wind Turbines.* **EDUCATION:** M.S., 1933, B.S., 1932, Physics, Univ. of Arizona. **PUBLICATIONS:** 3 primarily in Air Conditioning, Energy. **PATENTS:** 19 concerning Air Conditioning, Energy. **ACHIEVEMENTS:** Invention and Patenting of Innovative Air Conditioning Systems, Work with Solar Thermal Photovoltaic and Wind Systems. **ORGANIZATIONS:** Phi Beta Kappa, Delta Pi Sigma, Sigma Xi, IEEE, ASRAE. **HONORS/AWARDS:** Membership in Phi Beta Kappa, Natl. Honor Society, Sigma Xi, IEEE.

Perkins, Henry C. (Dr) (602) 621-2573

Professor, Univ. of Arizona, Mech. Engrg. Dept., Tucson, AZ 85721. **EXPERTISE:** *Heat Transfer, Thermodynamics.* **PAST AFFILIATIONS:** Visiting Prof., Stanford Univ, 1981-82; Visiting Prof., USMA West Point, 1978-79; Visiting Prof., Danish Tech. Univ, 1971-72; Act. Assistant Prof., Stanford Univ, 1963-64. **EDUCATION:** B.S., 1957; M.S., 1960; Ph.D., 1963, all Stanford Univ. **PUBLICATIONS:** 20 primarily in Heat Transfer, Thermodynamics. **Books:** Author of 23, Co-author of 2. Most significant book, "Engineering Thermodynamics", McGraw-Hill, 1977. **ACHIEVEMENTS:** Co-author "Handbook of Heat Transfer", McGraw-Hill, 1973. **ORGANIZATIONS:** Member, American Soc. of Mechanical Engrg., Air Pollution Control Association, Sigma Xi. **HONORS/AWARDS:** Univ. of Arizona, Creative Teaching Award, 1982; SAE Teetor Award, 1975; U.S. Army Outstanding Civilian Service Award, 1980; Phi Beta Kappa, 1957.

Rajan, Subramaniam D. (Dr) (602) 965-1712

Asst. Prof. of Civil Engineering, Arizona State University, Dept. of Civil Engrg., Tempe, AZ 85287. **EXPERTISE:** *Computer-Aided design of Structural Mechanical systems, Engineering database management systems, Engineering design through optimization techniques.* **PAST AFFILIATIONS:** Rsch. Asst., Univ. of Iowa, 1978-83. **EDUCATION:** Ph.D., 1983; M.S., 1979; Both at Univ. of Iowa; B. Tech., Indian Inst. of Tech., 1978; All in Civil Engrg. **PUBLICATIONS:** 15 primarily in Optimal Design, Optimization Tech., Finite Elements, Computer-aided design, Database mgmt., Computer graphics. **ACHIEVEMENTS:** Dev. of software & programming systems for the optimal design of structural & mech. systems through the use of optimization tech., finite elements, computer graphics & enrg. database mgmt. tech. **ORGANIZATIONS:** Am. Soc. of Civil Engrg.; Assoc. for Computing Machinery. **HONORS/AWARDS:** Rsch. & Teaching Fellow. by the Univ. of Iowa.

Shaw, Milton C. (Dr) (602) 965-3688

Professor of Engrg., Arizona State Univ, Tempe, AZ 85287. **EXPERTISE:** *Mechanical design, Materials behavior, Tribology, Manufacturing engineering.* **PAST AFFILIATIONS:** 1961-77, Head, Mech. Engrg., Carnegie-Mellon Univ, 1946-61, Professor, Mech. Engrg., Mass. Institute of Technology; 1942-46, Chief, Materials Branch, NASA. **EDUCATION:** Dr. Hon Causa, Univ. of Louvain, Belgium, 1970; ScD, Univ. of Cincinnati, 1942; ME Sc, Univ. of Cincinnati, 1940; BSME, Drexel Univ, 1938. **PUBLICATIONS:** 250 primarily in Metal Cutting, Lubrication, Grinding, Bearings, Behavior of Materials. **Books:** Author of 1, Co-author of 1, and Editor of 6. "Analysis and Lubrication of Bearings", McGraw Hill, 1949. Most significant book, "Metal Cutting Principles", Oxford Univ. Press, 1984. **PATENTS:** 19 concerning Grinding Wheels, Mechanical Activation, Mechanical Design. **ORGANIZATIONS:** NAE, AAAS, ASME, ASM, SME, ASEE, Polish Acad. of Sci, Lubrication Engrs, Coll International Pour l'Etude Scientifique des Techniques de Production Mécanique. **HONORS/AWARDS:** SME Education Award, Phillip McKenna Award, Am. Machinist Award, Am. Soc. for Metals Wilson Award, ASLE National Award, ASTM Gold Medal, John Simon Guggenheim Research Fellow, George Westinghouse Award of ASEE, others.

So, Ronald M. C. (Dr) (602) 965-4119

Professor, Dept of Mech & Energy Systems Engrg, Arizona State Univ, Tempe, AZ 85287. **EXPERTISE:** *Fluid Mechanics, Nuclear Reactors, Turbulence, Turbine Heat Transfer, Combustion.* **PAST AFFILIATIONS:** Mech Engr, General Electric Co, 1976-81; Assist Prof, MIAE Dept, Rutgers Univ, 1972-76; Postdoctoral Fellow, MIAE Dept, Rutgers Univ, 1972-74; Rsch Sci, Union Camp corp, R & D Div, 1970-72. **EDUCATION:** Ph.D. Mech & Aero. Sci, Princeton Univ, 1971; MA, Princeton Univ, 1968; M Eng. Mech Engrg, McGill Univ, 1966; BSc, Engrg, Hong Kong Univ, 1962. **PUBLICATIONS:** 30 primarily in Fluid Mechanics, Heat Transfer, Combustion, Turbulence. **ACHIEVEMENTS:** Developed Computational Codes for Turbine Heat Transfer and Combustion; Basic Contribution to Turbulence Res. **ORGANIZATIONS:** Member of ASME, AIAA, APS, NY Acad. Sci.; Member, Sigma Xi. **HONORS/AWARDS:** Commonwealth Scholar, 1964-66; Publication Award, G.E. Co, 1981.

Thomson, Quentin R. (Dr)

Professor, Univ. of Arizona, Tucson, AZ 85721. **EXPERTISE:** *Engineering Economics, Energy Management.* **PAST AFFILIATIONS:** Comdr., U.S. Navy, 1941-50; Engineer, Pratt Whitney Aircraft, 1940-41; Univ of Ariz, 1950-80. **EDUCATION:** B.S.M.E., Georgia Tech; M.S.M.E., Univ of Arizona; Ph.D., California Western Univ. **PUBLICATIONS:** 4 primarily in Engineering. **PATENTS:** 3 concerning Air Diffusion. **ACHIEVEMENTS:** Bronze Star Medals. **ORGANIZATIONS:** ASME, ASHRAE, SAE, Tau Beta Pi, Phi Kappa Phi. **HONORS/AWARDS:** SAE Teetor Award, SAE Achievement Award, ASHRAE Achievement Award.

Watson, Harold G. (Dr) (602) 869-8067

President & General Manager, Universal Propulsion Company, Inc., Box 1140, Black Canyon Stage 1, Phoenix, AZ 85029. **EXPERTISE:** *Rockets & Propellant Actuated Devices.* **PAST AFFILIATIONS:** 1968-present, UPCC; Dir. of Eng., Space Ordnance Systems, 1964-68; Dir. of Eng., Rocket Power, 1961-64, Chief Eng., 1958-61. **EDUCATION:** BS, Univ of Arizona, 1954, primarily in Propellant Actuated Devices. **PATENTS:** 2 concerning Aircraft Escape Systems - "Ejected Pilot Stabilizing, Retarding, Separating & Parachute Deployment Sub-System", Jan 21, 1975. **ACHIEVEMENTS:** Development of a family of rocket catapults for aircraft escape system ejection seats. **ORGANIZATIONS:** AMA, Am Ordnance Assoc; AIAA; Survival & Flight Equipment Assoc; AF Assoc; Intl Pyrotechnics Soc; ADPA.

Yellott, John I. (Prof) (602) 943-5805

President, John Yellott Engineering Assoc, 901 W. El Caminito, Phoenix, AZ 85021. **EXPERTISE:** *Solar energy uses and control.* **PAST AFFILIATIONS:** Dist. Prof. in Arch. Ariz. St. Univ, 1972-1979, Headmaster Phoenix Country Day Schl, 1966-1972, Dir. Yellott Solar Energy Lab, 1958-1966, Dir. Assoc. for Appl. Solar Energy 1955-1958, Dir. of Res. Loco. Devel. Comm. 1945-1955. **EDUCATION:** Johns Hopkins Univ, B.S.M.E. 1931-33. **PUBLICATIONS:** 300 primarily in Engr. Ed. Supersaturated steam, coal-burning gas turbines, var. aspects of solar energy tech. **Books:** Editor of 10. Contrib. on pulverized coal & solar energy to "Encyclopedia of Britannica". **PATENTS:** 90 concerning Coal-burning gas turbines, med. instr., solar energy measuring instr., "Solar Radiation Measuring Instrument", 1964. **ACHIEVEMENTS:** Solving Problems of steam flow through nozzles 1940; eliminating noise from high-pressure reducing valves 1939; invention & devel. of coal-burning gas turbine for locomotive use 1945-55. **ORGANIZATIONS:** Fellow, ASME, ASHRAE, AAAS, Royal Soc. of Arts, London, Az Acad. of Sci. **HONORS/AWARDS:** Jr. Award ASME 1939, Pi Tau Sigma Gold Medal 1940, Dist. Fellow Award ASHRAE 1979, Cent. Award ASME 1979, Stephens Inst. Honor Award 1980, membership in the Order of the British Empire 1966.

ARKANSAS

Cummings, Samuel D., Jr. (Dr)

(501) 374-3731

Principal Office, Pettit & Pettit Consulting Engrs., Inc., 700 Wallace Bldg., Little Rock, AR 72201. **EXPERTISE:** *Building HVAC Systems, Building Systems Energy Conservation.* **EDUCATION:** BSME, Univ. of Ar., 1971. **ACHIEVEMENTS:** Professional Engr. (Arkansas & Oklahoma), lectures regarding energy consuming systems in commercial & institutional buildings, instructor of Prof. Engr. Test Review courses. **ORGANIZATIONS:** Past Chairman, Arkansas ASHRAE; Past Chairman, Arkansas PEPP; Past Chairman, Arkansas Engineering Foundation; NSPE; ASME; ACEC. **HONORS/AWARDS:** Arkansas ASHRAE 1980 Memorial Award; Who's Who in Engineering (4th Edition).

Haynes, Wallace O. (Prof) (501) 523-2771

Engineering and Maintenance Manager, Revere Copper and Brass, Hwy 67 N. Newport, AR 72112. **EXPERTISE:** *D.C. Drive Systems for Mills and Separators, Oven and Oven Controls.* **PAST AFFILIATIONS:** Aerospace Eng. Burroughs Corp, 1959-72; Aerospace, Chrysler Corp, 1957-59. **EDUCATION:** EE, Elect Eng, Lawrence Inst Tech, 1959. **PUBLICATIONS:** 20 primarily in maintenance, failure analy., mill design. **ACHIEVEMENTS:** Laminations—designed & built a state of the Art Laminator Coater, many Mill Design features; Designed & built an annealing furnace X-O gas Generator Modification. **ORGANIZATIONS:** ASLE; Amer Soc of Lubrication Engrs; SME; Soc of Mfg Engrs.

CALIFORNIA

Adler, William F. (Dr)

Mgr., Materials Group, Effects Technology, Inc., 5383 Hollister Ave, Santa Barbara, CA 93111. **EXPERTISE:** *Thermomechanical Responses of Materials; Engineering Mechanics, Continuum Mechanics, Computer Modeling, Erosion, Fracture Mechanics, Experimental Mechanics.* **PAST AFFILIATIONS:** Principal Scientist, Bell Aerospace, Buffalo, NY, 1971-76; Sr. Res. Scientist, Battelle Memorial Inst., Columbus, OH, 1965-71. **EDUCATION:** Ph.D., Engrg. Mechanics, Columbia Univ., NYC, 1965; M.S., Mechanics, 1961, B.S., Civil Engrg., 1958, IL Inst. of Tech., **PUBLICATIONS:** 60 primarily in Mechanics, Materials Science, Erosion of Materials. **Books:** Editor of 2. Most significant book, "Inelastic Behavior of Solids", McGraw-Hill, 1970; "Erosion: Prevention & Useful Applications", STP 664, ASTM 1979. **ACHIEVEMENTS:** Chmn., 1976-77, Natl. Materials Advisory Bd. Committee (Natl. Acad. of Scis.) on Conservation of Materials through the Reduction of Erosion in Energy Systems. **ORGANIZATIONS:** Am. Cer. Soc., ASTM (Chmn., 1974-80, Subcommittee G2.20, Erosion by Solid Particle Impingement), Soc. of Engrg. Scis. **HONORS/AWARDS:** Higgins Fellow, Graduate Faculty of Pure Science, Columbia Univ.; Chi Epsilon and Tau Beta Pi; Sigma Xi.

Akin, Lee S. (Dr)

Manager-Mechanical Analysis, Aerojet Electro Systems Co., Azusa, CA 91702. **EXPERTISE:** *Gear Mechanisms, Gear Lubrication and Cooling, Noise and Vibration Analysis of Rotating Machinery.* **PAST AFFILIATIONS:** Technical Program Manager, Western Gear Corp., ATD; General Electric, Consulting Engr.; McDonnell Douglas, Branch Chief; General Dynamics, Systems Mgr.; Waste King Corp., Sr. Project Engineer. **EDUCATION:** Ph.D., M.E., West Coast Univ, 1965; M.S.A.P., West Coast Univ, 1960; B.S.G.E., West Coast Univ, 1958. **PUBLICATIONS:** 26 primarily in Lubrication and Gear Engineering. **Books:** Author of 1. Most significant book, "Gear Lubrication and Cooling". **ACHIEVEMENTS:** Devised a Method of Rating Gears for Scoring Mode of Gear Tooth Failure. **ORGANIZATIONS:** ASME Fellow. **HONORS/AWARDS:** Douglas Achievement Award.

CALIFORNIA-Cont.

Allen, Charles W. (Dr)

Professor, California State Univ, Chico, CA 95929. EXPERTISE: *Traction in Elastohydrodynamic Lubrication, Bearing Analysis*. PAST AFFILIATIONS: Assoc in Engrg, Univ of Calif, Davis, 1965-66; Group Leader, Cryogenic Bearing Dev, Aerojet General, 1962-63; Design Engr, Lear Siegler, 1957-62. EDUCATION: BSME, Univ of London, 1957; MSME, Cse Inst of Tech, 1962; PhD, Univ of Calif, Davis, 1966. PUBLICATIONS: 11 primarily in Lubrication & Engrg Educ. ACHIEVEMENTS: Devel of Traction Models for Elasto Hydrodynamic Lubrication. ORGANIZATIONS: ASME, ASEE. HONORS/AWARDS: NASA Fellowship, 1967, 1968, 1969; Vstg Fellow, Univ of Leicester, England, 1974.

Andon, Jerar (Dr)

(805) 965-7707

Consulting Mechanical Engineer, 98 Loma Media Road, Santa Barbara, CA 93103. EXPERTISE: *Automotive Research and Development*. PAST AFFILIATIONS: Univ of Calif, Santa Barbara, So. Coast Technology, AMF-Advanced Sys. Lab, Minicars Inc., General Motors Engrg. & Research Staffs, Civil Engineering Lab., U.S. Navy. EDUCATION: MSME, Stanford Univ. 1968; BME, General Motors Inst., 1950. PUBLICATIONS: 8 primarily in Auto. Engineering. Books: Author of 1, and Editor of 1. Most significant book, "An Init.Assessment of the Lit. on the Measurement,Control,Transport,Transformation & Health Effects of Diesel...". PATENTS: 2 concerning Auto Engines & Dynamic Toys; Valve Actuation Device, 1954. ACHIEVEMENTS: Development of High Compression Engines and Automobile Safety Structures. ORGANIZATIONS: Soc. of Auto. Engrs., American Soc. of Mech. Engrs. Inst. of Mech. Engrs. (Great Britian). HONORS/AWARDS: Soc. of Auto. Engrs. Horning Memorial Award, 1964.

Arnold, W. F. (Dr)

(415) 422-0561

Assistant Associate Director, Lawrence Livermore Lab, P.O. Box 808, Livermore, CA 94550. EXPERTISE: *Engineering Management, Manufacturing Engineering, Metallurgy-Nuclear Materials*. PAST AFFILIATIONS: Los Alamos Scientific Lab; Symington Gould Corp. EDUCATION: BS, ME, Univ of Ill, 1942. PUBLICATIONS: 50 primarily in Materials Engineering (classified and unclassified). ACHIEVEMENTS: Atomic Energy Commission Citation, Nuclear Explosive Testing. ORGANIZATIONS: ASME, ADPA, SME.

Avery, Robert T. (Dr)

Staff Sr. Scientist, Mech Engrg, Univ of CA, Lawrence Berkeley Lab, 1 Cyclotron Road, Berkeley, CA 94720. EXPERTISE: *Engrg of particle accelerators, Magnets, Vacuum systems*. PAST AFFILIATIONS: Project Mgr., W.M. Brobeck & Assoc., 1961-66. EDUCATION: D. Engrg, Mech. Engrg, U.C. Berkeley, 1974. PUBLICATIONS: 28 primarily in particle accelerators, electromagnets. PATENTS: 10 concerning particle accelerators - "Electron accelerator with specific deflecting magnet structure and X-ray target" - 1967. ACHIEVEMENTS: Novel contributions to the engrg design of particle accelerators and associated equipment. ORGANIZATIONS: ASME, IEEE, NSPE, CA Soc. Prof. Engrs. HONORS/AWARDS: Registered Professional Engr (ME, EE, & CE).

Barkan, Philip (Dr)

(415) 497-3793

Prof. of Mechanical Engineering, Stanford Univ., Stanford, CA 94305. EXPERTISE: *Transient Mechanical Phenomena, Elect. Power Protection*. PAST AFFILIATIONS: Mgr. of Applied Physics and Mech. Engineering, General Electric Co., 1953-77; Asst. Prof. of Engineering Research - Penn State Univ. - 1948-51. EDUCATION: Ph.D. Pennsylvania State Univ., 1953; M.S. Mechanical Engineering, Univ. of Mich., 1948; B.S. Mechanical Engineering, Tufts Univ., 1946. PUBLICATIONS: 45 primarily in Mechanism; Dynamics; Electric Power Protection Devices; Arc Phenomena. Books: Co-author of 2. Most significant book, Ch. 16 "Impact" Mechanical Systems and Design, McGraw

Hill. PATENTS: 49 concerning Electric Power Protection Devices. ORGANIZATIONS: IEEE; ASME; Sigma Xi. HONORS/AWARDS: Fellow, IEEE, 1972; GE Steinmetz Medal Technical Excell, 1973; Elected to Nat. Academy of Engineering, 1980.

Baxter, Gene K. (Dr)

(916) 920-1900

Manager, Engineering, Baker International, Exploration Logging, Inc., P.O. Box 214676, Sacramento, CA 95821. EXPERTISE: *Engineering Management, Mechanical Design and Analysis*. PAST AFFILIATIONS: Schlumberger Tech Corp., 1982-83; GE/Space Div, 1977-82; GE/Electronic Systems Div., Syracuse NY, 1968-77. EDUCATION: Ph.D., ME, Syracuse Univ, 1971. PUBLICATIONS: 30 primarily in Heat Transfer, Mechanical Vibrations, Structures, and Gas Dynamics. ACHIEVEMENTS: Directed State-of-the-Art Projects Creating New Heat Transfer & Thermal Measure Tech for Electronic Sys, & New Mech Designs for Optics Display, Computer, & Digital Control Equip for Crew Training & Simulation Sys; new electromech system designs for downhole measure of drilling & formation parameters; Licensed Prof Engr, NY. ORGANIZATIONS: IEEE, ASME, SPE, Sigma Xi Research Society, Phi Kappa Phi, Tau Beta Pi. HONORS/AWARDS: Sr. Member, IEEE, 1975; NDEA Fellowship, 1961-64; Machinery Magazine Design Award, 1961; Idaho State Board of Engineers Award, 1961.

Beadle, Charles W. (Dr)

(916) 752-1436

Chmn., Dept. of Mech. Engrg., Univ. of CA, Davis, CA 95616. EXPERTISE: *Mechanical Engrg. Design*. PAST AFFILIATIONS: Res. Labs Div., RCA, 1954-57; Res. Labs Div., General Motors Corp., 1951-54. EDUCATION: Ph.D., Cornell Univ., 1961; M.S.E., Univ. of MI, 1954; B.S., Tufts Univ., 1951. PUBLICATIONS: 15 primarily in Mechanical Engrg., Structural Mechanics. ACHIEVEMENTS: Engineering Educator. ORGANIZATIONS: ASME. HONORS/AWARDS: Tau Beta Pi, Ford Fndn. Fellow.

Beck, Niels J. (Dr)

(619) 270-6760

President, BKM, Inc., 5141 Santa Fe St., San Diego, CA 92109. EXPERTISE: *Engine Technology*. PAST AFFILIATIONS: Group V.P., Rohr Industries. EDUCATION: Ph.D., Univ of Wisconsin. PUBLICATIONS: 24 primarily in Automotive Engineering. PATENTS: 4 concerning Mechanical Products, Engines, Idle Governor, Chain Saws. ACHIEVEMENTS: Organized White Motors Advanced Products Div. ORGANIZATIONS: SAE, ASME, AIAA. HONORS/AWARDS: Univ of Wisconsin, Distinguished Service Citation; Research Fellow, General Motors Corp.; Assoc. Fellow, AIAA.

Bell, Robert A. (Dr)

Head of General Engrg., SLAC, PO Box 4349, Stanford, CA 94305. EXPERTISE: *Mechanical Engrg. Of Particle Accelerators*. PAST AFFILIATIONS: CERN, 1969-72; SLAC, 1965-69; Wm. M. Brobeck & Assoc., 1960-65. EDUCATION: M.S., 1960, Univ. of CA Berkeley, Aeronautical Sciences; B.S., 1958, Univ. of CA, Berkeley, Mech. Engrg. PUBLICATIONS: 10 primarily in Nucl. Sci. ACHIEVEMENTS: Chief Mechanical Engr. of Positron-Electron Project (PEP). ORGANIZATIONS: SAE. HONORS/AWARDS: Visiting Scientist European Organization for Nucl. Res., 1969-72. Pi Tau Sigma, Tau Beta Pi.

Berger, Stanley A. (Dr)

(415) 642-5950

Professor of Engineering Science, Univ of California, Etcheverry Hall, Berkeley, CA 94720. EXPERTISE: *Fluid Mechanics, Bioengineering*. EDUCATION: PhD, Brown Univ, 1959; BS, Brooklyn Coll, 1955. PUBLICATIONS: 60 primarily in Fluid Mechanics, Bioengineering. Books: Author of 1. Most significant book, "Laminar Wakes", Elsevier, 1971. ACHIEVEMENTS: Contributions to the Study of Wake Flows, Viscous Flows, MHD, Blast Waves, Trailing Vortices, Bio-Fluid Mechanics. ORGANIZATIONS: AIAA, ASME, APS, AAAS, Sigma Xi, SIAM. HONORS/AWARDS: Fellow, AAAS, 1982; Fellow, APS; Assoc Fellow, AIAA.

Bergmann, Duane A. (Dr)

(818) 335-1204

President, Bergmann Engineering, Inc., 220 S. Glendora Ave, Glendora, CA 91740. EXPERTISE: *Industrial Turbomachinery and Power Generation Systems*. PAST AFFILIATIONS: Chief Engineer, Process Turbomachinery, Airco Cryogenics, 1964-79. EDUCATION: MSME, Univ of Southern California, 1964. PUBLICATIONS: 4 primarily in Turbomachinery, Cryogenics, Power Systems. ACHIEVEMENTS: Licensed Professional Engineer in CA, IA, OK; Extensive Experience in Design and Analysis of Equipment for Natural Gas Processing; Power Recovery and Cryogenics. ORGANIZATIONS: American Society of Mechanical Engineers; Pacific Energy Association; Gas Processors Association.

Brown, Tony R. (Dr)

(714) 476-5229

Vice President, Planning & Acquisitions, American Hospital Supply Corp., Medical Sector, 2132 Michelson Dr., Irvine, CA 92715. EXPERTISE: *Technical and General Management*. PAST AFFILIATIONS: V.P., Rsch & Business Devel, Amer Pharmaseal, 1975-84; V.P., R&D, Amer Pharmaseal 1972-75; Midwest Applied Science Corp, V.P. & Board of Dir, 1971-72; V.P. & Dir Engrg, 1970-71; Mgr Engrg, 1969-70. EDUCATION: Ph.D., Purdue Univ, 1968; M.S.M.E., 1964; B.S.M.E., 1962. PUBLICATIONS: 4 primarily in Heat Transfer. PATENTS: 1 concerning Health Care. ACHIEVEMENTS: Vice President of Business Planning and Development, Product Research and Development and Package/Process Development Operations. ORGANIZATIONS: Assoc for the Advancement of Med Instrumentation; ASME; Amer Mgmt Assoc; Soc for the Advancement of Mgmt; Southern California Corp of Planners Assoc; Amer Mgmt Assn R&D Council, 1984. HONORS/AWARDS: Amer Business Womens Assoc, 1976-77 "Boss of the Year"; Soc for the Advancement of Mgmt, 1980 "Manager of the Year"; Phamaseal Hall of Fame.

Burdick, Robert E. (Dr)

President, OmniMotionNeers, Inc., 4646 Puente Plaza, Santa Barbara, CA 93110. EXPERTISE: *Fluid Film Systems*. PAST AFFILIATIONS: 1968-80, V.P. and Director of Engrg., Rolair Systems, Inc.; 1962-68, Executive Engr., General Motors Corp.; 1960-62, Senior Research Engr., Atomics International; 1957-60, Sr. Design Engr., Marquardt Aircraft Co., 1951-55, Designer, Deere & Co. EDUCATION: Univ of California at Los Angeles, Post Grad. Engrg.; Iowa State Univ, B.S.M.E., 1955-57; U.S. Naval Academy, Engrg., 1949-51. PATENTS: 20 concerning Thermoelectricity, Pneumatics, Controls; "Thermoelectric Converter Module for Nuclear Powered Space Applications", 1961. ACHIEVEMENTS: Project Engineer/Manager of Movement System of Aloha Stadium, from Concept to Operation. ORGANIZATIONS: Pi Tau Sigma, Registered Professional Engr. in California and Iowa. HONORS/AWARDS: Outstanding Achievement, 1975. Citation by Engrg. News.

Catton, Ivan (Dr)

Professor, Univ of California, 405 Hilgarde Ave., Los Angeles, CA 90024. EXPERTISE: *Nuclear Power Plant Safety, Heat Transfer & Hydraulics in Nuclear Plants*. PAST AFFILIATIONS: Supervisor, McDonnell Douglas Astronautics, 1959-67. EDUCATION: Ph.D., Engr., Univ of California, 1966; B.S., Engr., 1959. PUBLICATIONS: 85 primarily in Heat Transfer and Fluid Mechanics. Books: Editor of 2. Most significant book, "Natural Convection in Enclosures", ASME, 1980. PATENTS: 1 concerning Fluid Mechanics, Oscillatory Valve for Gas Ingestion Control. ACHIEVEMENTS: Keynote Speaker at the 8th International Heat Transfer Conference; Consultant to the Advisory Committee on Reactor Safety. ORGANIZATIONS: ASME, APS, ANS. HONORS/AWARDS: Douglas Fellow.

Charley, Philip J. (Dr)

(714) 730-6239

President, Truesdail Labs, Inc., 14201 Franklin Ave, Tustin, CA 92680. EXPERTISE: *Forensic Engineering*. PAST AFFILIATIONS: Vice-Pres. Truesdail Labs., 1954-71; Engineer Std. Oil, Calif, 1947-54. EDUCATION: Ph.D. Chem, USC, 1960; MSME, USC, 1947; BSME, Univ of Wisconsin, 1943. PUBLICATIONS: 10 primarily in Chemistry. PATENTS: 2 concerning Chemistry. ORGANIZATIONS: Tau Beta Pi, ASME, ASM, SAE, ASTM, Sigma Xi, ASEE. HONORS/AWARDS: Devel Award, USC, 1960, Research Assoc. USC, 1960-64.

CALIFORNIA-Cont.

Charwat, Andrew F. (Dr) (213) 825-4197

Prof., Engrg., Univ. of California, Los Angeles, CA 90024. **EXPERTISE:** *Fluid Mechanics, Mechanical Engineering, Experimental Techniques.* **PAST AFFILIATIONS:** Prof., UCLA - 1955-Present; Northrop Aircraft Corp., Preliminary Designer, 1953-1955; Propulsion Res. Corp., Aerodynamicist 1952-53. **EDUCATION:** Ph.D., Univ. of California at Berkeley, 1952; Mech. Engrg., Stevens Inst. Tech., 1948. **PUBLICATIONS:** 80 primarily in Fluid Mechanics and Power Systems. **Books:** Editor of 1. **PATENTS:** 2 concerning Instrumentation. **HONORS/AWARDS:** Guggenheim Fellow; Fulbright Fellow; Tau Beta Pi; Sigma Xi; Numerous Grants for Research.

Chilton, Ernest G. (Dr)

Prof. of M.E., Stanford Univ., Stanford, CA 94305. **EXPERTISE:** *Design of Mechanical Devices, Design Methodology.* **PAST AFFILIATIONS:** Stanford, 1973-date; AZ State Univ., 1969-73; SRI International, 1959-69. **EDUCATION:** Ph.D., M.E., Stanford, 1947; M.S., Ae.E., Caltech, 1941; S.B., Ae.E., MIT, 1940. **PUBLICATIONS:** 32 primarily in Appl. Mechanics, Fluid Mech., Instrumentation, Vibration, Transportation. **Books:** Author of 2. 1 translated. **Most significant book,** "Design-Serving the Needs of Man", Macmillan, 1973. **PATENTS:** 3 concerning Combustion, Pipe Flow - "Fuel Utilization Process", 1957. **ACHIEVEMENTS:** Logical design system for pulsation dampers for pumps and compressors. **ORGANIZATIONS:** Fellow ASME, ASEE, Sigma Xi. **HONORS/AWARDS:** 1st Class Honors, London Univ., 1939; Royall Victor Fellowship, Stanford, 1946.

Coplen, Herman L., Jr. (Dr)

Principal, EnCoTech, 3092 Sudbury Road, Shingle Springs, CA 95682. **EXPERTISE:** *Geothermal Power Plant Design, Nuclear Power Plant Design, Rocket Power System Design, Biological Process Design, Technical Management.* **PAST AFFILIATIONS:** Project Manager, Rogers Eng. Co., 1975-76; LOFT Program Manager, Aerojet Nuclear Co., 1969-75; APOLLO Program Manager, Aerojet-General Corp., 1965-69; Manager, Eng. Division, Liquid Rocket Plant, Aerojet-General Corp., 1961-65. **EDUCATION:** BSME, Purdue Univ., 1937; Grad. courses in ME & NuE, UCLA, 1944-53. **PUBLICATIONS:** 10 primarily in Geothermal, Nuclear Safety, Rocket Power Controls, Cryogenics, Biological Organics Energy Conversion. **PATENTS:** 6 concerning Fluid Control Devices; Rocket Power Control Systems. **ACHIEVEMENTS:** Directed the design and construction of the LOFT NUCLEAR SAFETY TEST FACILITY to completion; directed the design and qualification of the NASA APOLLO Service Module Main Propulsion Engine to successful first flight. **ORGANIZATIONS:** ASME, ANS, Sigma Xi, Triangle Fraternity. **HONORS/AWARDS:** Outstanding Performance Award for APOLLO Program Management-1969.

Crawford, Robert F. (Dr)

Vice President of Engineering, AEC-ABLE Engrg. Co., Inc., 5790 Thornwood Dr., Goleta, CA 93017. **EXPERTISE:** *Structural Analysis, Deployable Structural Mechanisms, Light Weight Structures, Materials.* **PAST AFFILIATIONS:** Memb. Tech. Staff, Gen'l Res. Corp., 1978-1979. **EDUCATION:** MS Applied Mech., VPI, 1955. **PUBLICATIONS:** 20 primarily in structural mechanics, materials, mechanisms and minimum weight design. **PATENTS:** 4 concerning materials, structural - designs and mechanisms, tennis racket. **ACHIEVEMENTS:** Pioneered in optimum design analysis for stiffened plates and shells; developed two types of deployable lattice columns. **ORGANIZATIONS:** AIAA, Tau Beta Pi. **HONORS/AWARDS:** NASA Certificate of Recognition.

Darkazalli, Ghazi (Dr)

Director of Engineering Division, Applied Solar Energy Corporation, P. O. Box 1212, City of Industry, CA 91749. **EXPERTISE:** *Solar Energy, Thermodynamics, Heat Transfer, Wind Power, Engineering Economics.* **PAST AFFILIATIONS:** Asst. Professor of Mechanical Engrg., Univ. of Texas, Mech. Engrg. Dept., 1977-1980. **EDUCATION:** Ph.D., Univ. of MA, 1976. **PUBLICATIONS:** 20 primarily in Solar and Wind Energy/Mechanical Engineering. **ACHIEVEMENTS:** Dir. of the Solar Energy Research Facility at the Univ. of Texas. **ORGANIZATIONS:** ASME, ASHRAE, ISES, Soc. of Engrg. Science, Sigma Xi, Pi Tau Sigma, and Am. Soc. of Engrg. Education. **HONORS/AWARDS:** Principal Investigator of a Number of Research Grants and Contracts on Solar Energy and Heat Pump Applications.

Das, Mihir K. (Dr)

(213) 498-4407

Prof., Mechanical Engrg., California State Univ., 1250 Bellflower Blvd., Long Beach, CA 90808. **EXPERTISE:** *Computer Aided Design and Manufacture, CAD-CAM, Applied Vibrations and Structural Dynamics, Design of Machinery, Processes and Plants, New Product Development, Research and Development, Computer Applications.* **PAST AFFILIATIONS:** Sr. Rsch. Fellow, Birmingham Univ., England, 1971-81; I.C.I. Rsch. Fellow, I.C.I. Limited, England, 1969-71. **EDUCATION:** Ph.D., Mechanical Engrg., Birmingham Univ., England, 1965; B.S., Mechanical Engrg., Bihar Inst. of Technology, India, 1961. **PUBLICATIONS:** 62 primarily in advanced design and manufacturing, metal forming, vibrations. **CAD/CAM.** **PATENTS:** 2 concerning international patents on metal forming techniques. **ACHIEVEMENTS:** Originator of a new theory of Dynamic Metal Cutting which is used in the study of machine tool vibrations. **ORGANIZATIONS:** ASME; Inst. of Mechanical Engrs., London; Sr. Member, SME/RI. **HONORS/AWARDS:** Original contribution in machine tool dynamics which is now taught in Masters courses in machine tool technology.

Dean, Donald E. (Dr)

Director-Owner, Profit Design Consultants, 565 W. 5th Street, San Pedro, CA 90731. **EXPERTISE:** *Applied Fluid Power, Energy Conservation, Inventive Machinery & Mfg. Processes.* **PAST AFFILIATIONS:** Chief Engr., Industrial Div., Republic Corp., 1970-71; Chief P.D., Sheridan-Gray Inc., 1967-70; Systems Mgr., Cosmodyne Corp., 1966-67. **EDUCATION:** B.S., San Jose State Univ., 1952; A.A., Hartwell College, 1949. **PUBLICATIONS:** 6 primarily in Metal Forming, Energy Conservation, Hydraulic Systems- Presses. **Books:** Author of 1. **Most significant book,** "Conserving Energy", SPE Inc., Sept. 1975. **PATENTS:** 5 concerning Hydraulic Presses- "Method for Forming Plastic Sheets", 1977. **ACHIEVEMENTS:** Central Hydraulic Test System for NASA-Dryden Flight Res. Ctr., Calif., 1975; Double Plastic Sheet Forming System- 4 Patents, 1977. **ORGANIZATIONS:** Board of Directors, Fluid Power Soc., 1968-70; Board of Dir., Soc. of Plastics Engrs., Inc., 1974-78. **HONORS/AWARDS:** Design & Technology Award- Innovative Processing, Soc. of Plastics Engrs., 1978.

Decker, Gerald L. (Dr)

Vice Pres., Kaiser Aluminum & Chem. Co., 300 Lakeside Dr., Oakland, CA 94643. **EXPERTISE:** *Energy Conservations (Cogeneration).* **PAST AFFILIATIONS:** Corp. Energy Mgr., Dow Chem. Co., 1957-77; Supt. of Power Operations, Dow Chem. Co., 1950-57. **EDUCATION:** Doctor of Laws (Honorary), Olivet Nazarene Coll., 1974; MS, Univ. of Mich., 1950, BS, Alma Coll., 1949. **PUBLICATIONS:** 100 primarily in Energy Mgmt., Technology & Conservations. **ACHIEVEMENTS:** Natl. Coal Policy Project; Cogeneration Study. **ORGANIZATIONS:** AIChE, ASME, NSPE. **HONORS/AWARDS:** Energy Exec. of Year, 1981, AIChE Service to Soc. Award, 1979, N.E.R.O. Distinguished Service Award, 1977; Sec. of Commerce Medal, 1974.

De Soto, Simon (Dr)

(213) 498-4283

Professor & Vice Chairman, Mech. Eng., California State Univ., Long Beach, CA 90840. **EXPERTISE:** *Thermodynamics, Heat Transfer, Solar Energy.* **PAST AFFILIATIONS:** Lecturer, UCLA, 1954-70; Sr. Tech. Specialist, Rocketdyne Rockwell International, 1956-69; Research Specialist, Lockheed Missile Systems Div., Lockheed Corp., 1954-56. **EDUCATION:** Ph.D., UCLA, 1965; MME, Syracuse Univ., 1950; BME, CCNY, 1945. **PUBLICATIONS:** 15 primarily in Thermal Radiation, Conduction, Convection, Thermodynamics, Boundary Layers, Flames, Energy Policy, Scuba Diving Demand Regulators. **Books:** Author of 1. 2 Reviewed. **Most significant book,** *Thermostatics and Thermodynamics - Instructors Manual*, Van Nostrand, 1963. **ACHIEVEMENTS:** Devel NASA Analysis method for rocket plume radiation, directed early high speed aerodynamic heating research, design consultant for gas turbine starters for military aircraft. **ORGANIZATIONS:** AAAS, World Future Society. **HONORS/AWARDS:** Tau Beta Pi, Pi Tau Sigma; Faculty providing most stimulation & interest, UCLA Eng. Student Body, 1962; Outstanding Faculty Award, Calif. State Univ., Long Beach, 1971, 1973, 1976.

Doll, R. (Dr)

Research Engineer, TRW, One Space Park R1/2178, Redondo Beach, CA 90278. **EXPERTISE:** *Structural dynamics, Vibration analysis, Vibration & temperature measurement.* **PAST AFFILIATIONS:** Research Assistant at Berkeley, 1971-74; Part Time Faculty, CA State Univ., Los Angeles, 1967-69; Project Engineer at Barry Controls, 1964-1969. **EDUCATION:** Ph.D., Mechanical Engineering, U.C. Berkeley, 1979; M.S., Mechanical Engineering, USC, 1966; B.S., Mechanical Engineering, CA State Univ. at Los Angeles, 1969. **PUBLICATIONS:** 6 primarily in Vibration Analysis, Structural Dynamics and Instrumentation. **ACHIEVEMENTS:** Measurement of vibrations using laser radar; measurement of combustion gases using optical pyrometer. **ORGANIZATIONS:** Sigma Xi; U.C. Berkeley Alumni. **HONORS/AWARDS:** NST Grantee; Alpha Gamma Sigma; Pi Tau Sigma; Who's Who in the West 1980.

Dowell, Douglas C. (Dr)

(714) 626-0830

Professor of Mechanical Engineering, California State Poly. Univ., Pomona, 3801 West Temple, Pomona, CA 91768. **EXPERTISE:** *Energy Management.* **PAST AFFILIATIONS:** Pres. of Dowell Engineering, Claremont, CA, 1976-Pres; U.S. Air Force, 1942-45, 1949-68, Retired Lt. Colonel. **EDUCATION:** Ph.D., Engrg. Mech., Iowa State Univ., 1964; M.S. in Nuclear Engrg., A.F. Inst. of Tech., 1956; B.S., Civil Engrg., Univ. of Iowa, 1949. **PUBLICATIONS:** 25 primarily in Mechanics, Nuclear Engrg., Nuclear Weapons Development, Energy Mgmt., Engrg. Registration. **ACHIEVEMENTS:** Developed Five Institutes of Tech. for Greek Ministry of Education. Codirector of Ca. State Univ. Statewide Energy Consortium. Registered Prof. Engr. in Ca. & Idaho. **ORGANIZATIONS:** ASEE, Assn. of Energy Engrs. **HONORS/AWARDS:** 1980; Joint Recipient of Award From Acad. for Educational Development for Innovative Energy Projects. 1974; Award for Outstanding Achievement in Engrg. Work from Ca. Soc. of Prof. Engrs.

Ducasse, Victor J. C. (Dr)

Tech. Manager, Unice Machine Co., 1275 Columbus Ave., San Francisco, CA 94133. **EXPERTISE:** *Designer Cane Sugar Machinery and Structural.* **PAST AFFILIATIONS:** Chief Engr., Laupahohoe Sugar Co., 1968-75; Maintenance Engr., Belle Vue Mauricia Sugar Estate, 1962-68; Chief Draughtsman, Ateliers De Riviere Du Rempart, 1955-62. **PUBLICATIONS:** 2 primarily in Sugar Cane Machinery. **PATENTS:** 4 concerning Sugar Cane Machinery. **ACHIEVEMENTS:** Obtention of the Unigrator Patent, This Machine Is for Preparing Cane Stalks Prior to Milling or Diffusion and is Now Regarded by Experts in the Field to Be the Best of All Preparatory Equipment Ever Used in the Sugar Cane Industry. **ORGANIZATIONS:** International Soc. of Sugar Cane Tech. **HONORS/AWARDS:** Who's Who in Technology Today.

CALIFORNIA-Cont.

Eggleston, Glen E. (Dr)

Section Chief, Environmental Engr., McDonnell Douglas Corp., 3855 Lakewood Blvd., Long Beach, CA 90846. EXPERTISE: *Environmental Control of Aircraft, Air Conditioning, Ice Protection, Pneumatic & Oxygen Systems, Heat Transfer, Fluid Flow, Thermodynamics*. PAST AFFILIATIONS: Lecturer, U.C.L.A. Extension Div., 1953; Instructor, Univ. of Utah, 1949-51. EDUCATION: Ph.D., ME, Purdue Univ., 1953; MSME, Univ. of Wash., 1949; BSME, Univ. of Utah, 1944. PUBLICATIONS: 3 primarily in Heat Transfer, Heat Exchangers, Thermodynamics. Books: Co-author of 1. *Most significant book*, S.A.E. Aerospace Applied Thermodynamics Manual, 1960. PATENTS: 1 concerning Aircraft Air Conditioning, Variable Nozzle Cooling Turbine, 1958. ACHIEVEMENTS: DC-8 Air Conditioning Design, Saturn SIV Stage Design, DC-10 Design. ORGANIZATIONS: ASME, Past Member, Tau Beta Pi, Sigma Xi, Sigma Pi Sigma, Theta Tau. HONORS/AWARDS: Research Fellowship, Purdue Univ., 1951-53.

Engdahl, Paul D. (Dr)

President, Engdahl Enterprises, 2850 Monterey Ave., Costa Mesa, CA 92626. EXPERTISE: *Seismic Instruments*. PAST AFFILIATIONS: Chief Mechanical Engr., Astroscience Corp., 1964-71; Consultant, 1960-64; Operations Manager, Leach Corporation, 1958-60. EDUCATION: B.M.E., Univ. of Minnesota, 1949. PUBLICATIONS: 5 primarily in Seismic Instruments. PATENTS: 6 concerning Seismic Instruments and Accelerometers. ACHIEVEMENTS: The Design and Development of Response Spectrum Recorders and Peak Acceleration Recorders for Measuring the Effects of Earthquakes in the Vicinity of Nuclear Power Plants.

Eshel, Abraham (Dr)

Principal Engineer, Ampex Corp., MS3-22, 401 Broadway, Redwood City, CA 94063. EXPERTISE: *Analysis and Computer Simulation of Mechanical Problems, Particularly, Thin Webs, Disk Drives, Magnetic Recording, Gas Bearings, Foil Bearings*. PAST AFFILIATIONS: Assoc. Prof. (part time) San Jose State Univ. 1978-present; Assoc. Prof. Tel Aviv Univ. (Holon), Israel 1970-1972; Assist. Prof. Univ. of Alberta, Edmonton, Canada 1960-1963. EDUCATION: Sc.D., Mech. Engr., Columbia Univ., 1966; M.S., Computer Engr., Stanford Univ. 1976; M.M.E., Rensselaer Polytech. Inst., 1960; B.Sc., Technion, Haifa, Israel. PUBLICATIONS: 25 primarily in Tribology, Applied Mechanics, Computer Simulation. Contributed Chapters in 2 Books. PATENTS: 1 concerning Gas Bearings; Foil Bearing, 1979. ACHIEVEMENTS: Development of Foil Bearing Theories. ORGANIZATIONS: ASME.

Fleming, Lawrence T. (Dr)

Pres., Innes Instrument Co., 1830 Reiter Dr., Pasadena, CA 91106. EXPERTISE: *Applied Classical Physics*. PAST AFFILIATIONS: Principal Research Engr., Bell & Howell Research Ctr., 1959-67; Div. Engr., Southwestern Industrial Electronics Co., Houston 1956-59. EDUCATION: BS, Caltech, 1937. PUBLICATIONS: 51 primarily in Electronic & electromechanical instrumentation. PATENTS: 24 concerning Sci. & Engrg. Instruments. ACHIEVEMENTS: Orig. definition of random character of vibration of rockets & devising of appropriate accelerometers & shakers, at Ord. Div., Natl. Bureau of Standards (later "DOFL") 1948-53. HONORS/ AWARDS: Fellow, Acoustical Soc. of America, 1965.

Frazier, James L. (Dr)

(312) 321-3510

Senior Project Engineer, Burghmaster-Houdaille, 13900 S. Broadway, Los Angeles, CA 90061. EXPERTISE: *Machine Tool Design*. PAST AFFILIATIONS: Chief Project Engr., Master Mfg. Co., 1959-68. PATENTS: 8 concerning Mechanical, Machine Tools. ACHIEVEMENTS: "Tool Changer with Dual Axis of Rotation", Patented 1976 and numerous patented Machine Designs.

Fuchs, Henry O. (Dr)

Professor Emeritus, Stanford Univ., Mechanical Engineering Dept., Stanford, CA 94305. EXPERTISE: *Prevention of Fatigue Failures, Design of Machines*. PAST AFFILIATIONS: Pres., Metal Improvement Co., Chief Rsch. Engr., Preco Inc. EDUCATION: Dr. Engrg., Karlsruhe Tech. Univ., Graduate Engr. Karlsruhe. BPh, Strasbourg Univ. PUBLICATIONS: 50 primarily in Vibrations Automobile Dynamics, Metal Fatigue. Books: Co-author of 2. 3 Chapters in Books. Most significant book, *Metal Fatigue in Engineering*, Wiley, 1980. PATENTS: 25 concerning Shock Absorbers, Shot Peening Machines. ACHIEVEMENTS: Design of Peen Forming Machine for B-52 Wing Skins. Invention of Phase Plane Method of vibration analysis. ORGANIZATIONS: Fellow ASME, Fellow SAE, Member ASTM & SESA. HONORS/AWARDS: Carlson Award ASEE, Da Vinci Award ASME and others.

Geers, Thomas L. (Dr)

Sr. Staff Scientist, Lockheed Palo Alto Res. Lab., 3251 Hanover St., Palo Alto, CA 94304. EXPERTISE: *Applied Mechanics, Acoustic Radiation & Scattering*. PAST AFFILIATIONS: Sr. Engr., Cambridge Acoustical Associates, Cambridge, MA, 1964-66; Lt. US Navy, David Taylor Model Basin, Carderock, MD, 1961-63. EDUCATION: Ph.D., Applied Mechanics, MIT, 1967; M.S., Mech. Engrg., MIT, 1964; S.B., Physics, MIT, 1961. PUBLICATIONS: 25 primarily in Structural dynamics, acoustics. Books: Editor of 2. Most significant book, "Computational Methods for Fluid-Structure Interaction Problems", ASME, 1977. ACHIEVEMENTS: Formulation, development & implementation of "doubly asymptotic approximations" for the dynamic anal. of bodies of complex geometry embedded in infinite media. ORGANIZATIONS: ASME, Acoustical Soc. of Am., Sigma Xi. HONORS/AWARDS: 1979 Hess Award (ASME).

Gerstein, Melvin (Dr)

(213) 743-2585

Dean, Engineering, Univ. of Southern California, University Park, Los Angeles, CA 90007. EXPERTISE: *Fundamentals of Combustion*. PAST AFFILIATIONS: Assoc Dean, Eng. Univ. of S Calif; Dynamic Sci. Corp., Pres., 1960-67; Jet Propulsion Lab., Chief, Phys. Sci. Div., 1959-60. EDUCATION: Ph.D., Chem., Univ. of Chicago, 1945; B.S., Chem., Univ. of Chicago, 1942. PUBLICATIONS: 75 primarily in Combustion, Fuels, Inorganic Chem. Books: Editor of 2. ACHIEVEMENTS: Discovery of Internal Molecular Strains; Development of Theory of Laminar Flame Propagation; Contributions to Reduction of Fire Hazards; First Experimental Verification of Supersonic Combustion; Development of Solid Metallic & Slurry Fuels for Ramjets. ORGANIZATIONS: ASME, Combustion Inst. HONORS/AWARDS: Receptient Outstanding Achievement Award, Cleveland Tech. Societies Council, 1957; Mary Strong Sheldon Fellow, Univ. of Chicago, 1943-44; Eli Lilly Fellow, 1943-44; U.S. Naval Rsch. Lab., Hon. Fellow Univ. of Wisc., 1950; Phi Kappa Phi; Pi Tau Sigma.

Giedt, Warren H. (Dr)

(916) 752-0580

Professor Emeritus of Mech. Engrg., Univ. of California, Davis, CA 95616. EXPERTISE: *Heat Transfer and Electron Beam Welding*. PAST AFFILIATIONS: Professor of Mech. Engrg., Univ. of California, Berkeley, 1947-65. EDUCATION: Ph.D., Univ. of California, Berkeley, 1950; M.S., Univ. of California, Berkeley, 1947; B.A.S., Univ. of California, Berkeley, 1944. PUBLICATIONS: 100 primarily in Heat Transfer, Fluid Mechanics, Welding. Books: Author of 2, and Editor of 1. Most significant book, "Principles of Engrg. Heat Transfer", 1957, Van Nostrand. PATENTS: 3 concerning Temperature and Heat Flow Measurement; "Neutron Measuring Device and Heat Meter", 1962. ACHIEVEMENTS: Local Heat Flux Measurements in Guns; Interpretation of Electron Beam Welding from X-ray and Temperature Measurements. ORGANIZATIONS: ASME, ASEE, AWS. HONORS/AWARDS: 1970 Charles H. Jennings Memorial Award, presented by AWS for paper, "A Dynamic Interpretation of Electron Beam Welding"; 1974 G. Edwin Burks Award, ASEE; 1976 ASME Heat Transfer Memorial Award; others.

Glenn, Lewis A. (Dr)

Sr. Staff Physicist, Lawrence Livermore Natl. Lab, PO Box 808, Livermore, CA 94550. EXPERTISE: *Shock Hydrodynamics, Computational Physics & Mechanics, Material Physics*. PAST AFFILIATIONS: Staff Scientist, Inst. CERAC, Ecublens, Switzerland, 1971-77; Staff Scientist, Applied Theory, Inc., Los Angeles, 1968-71. EDUCATION: Ph.D., Engineering, Univ. So. CA, 1968; M.S. (M.E.), NJ Inst. of Tech., 1961; B.Ch.E., Polytechnic Inst. of NY, 1958. PUBLICATIONS: 40 primarily in Mechanics, Thermodynamics, Heat Transfer, Computational Physics, Shock Hydrodynamics, Material Physics. PATENTS: 2 concerning Fluid Mechanics, Heat Transfer - "Nozzle Means of Producing a High-Speed Liquid Jet", 1975. ACHIEVEMENTS: Developed the impulsive water cannon, invented a long-life, high-performance attitude control rocket engine (used on Minuteman Missile & Voyager/Mariner Spacecraft). ORGANIZATIONS: Am. Phys. Soc., Am. Inst. of Aeronautics & Astronautics. HONORS/AWARDS: North American Rockwell Science - Engineering Fellow.

Godfrey, Douglas (Dr)

Senior Engineer Associate, Chevron Rsch. Co., 576 Standard Ave., Richmond, CA 94802. EXPERTISE: *Tribology, Esp. Diagnosis of Wear Mechanisms*. PAST AFFILIATIONS: NASA - Lewis Rsch. Center Cleveland, 1944-55. EDUCATION: BSc, Chem. Engr. PUBLICATIONS: 50 primarily in Tribology (Lubrication, Friction & Wear). Books: Co-author of 3. Most significant book, "Wear Control Handbook", ASME, 1980. PATENTS: 3 concerning Hydraulic Fluids. 1970 Cavitation Resistant Fluid. ACHIEVEMENTS: Diagnosis of Wear Mechanisms. ORGANIZATIONS: ASLE. HONORS/AWARDS: ASLE Alfred E. Hunt Award; ASLE, Fellow.

Good, Melvin F. (Dr)

(619) 565-6727

President, Alega Corporation, 8977-A Complex Dr., San Diego, CA 92123. EXPERTISE: *HVAC, Process and Utility Piping Systems, Cogeneration, Systems Controls, Solar Energy and Construction Management*. PAST AFFILIATIONS: General Dynamics, 1961-65; Natkin & Co. 1956-61. EDUCATION: BSME, Univ. of Texas; MBA, National Univ., Master of Science in Systems Mgmt.; USC, 1982. ACHIEVEMENTS: Who's Who in Engrg., Who's Who in the West & Cal., Mayor's Committee for Energy Conservation, City of San Diego Energy; National Council of Engrg. Certif. Registered Mechanical, Civil & Controls Engineer. ORGANIZATIONS: ASME, American Arbitration Panel; SNAME, ASHRAE, American Society of Military Engrs., American Society of Energy Engrs.

Grafer, Edward B. (Dr)

President, Lebow Company, 38 Gerald Cass Pl., Goleta, CA 93017. EXPERTISE: *Vacuum and Thin Film Technology, Evaporation of Metals, Deposition of Thin Films*. PAST AFFILIATIONS: 1973-Present, Lebow Co.; 1967-73, Sloan Technology, Project Engr.; 1965-67, Unified Science, Engr. EDUCATION: B.S.M.E., 1965, Univ. of California, Berkeley, with Studies of Cryogenics and Nuclear Physics. PUBLICATIONS: 10 primarily in Thin Film Technology, Vacuum Technology. ACHIEVEMENTS: 1977 "IR100" and 1979 "IR100" for Development of 100 Most Significant New Technical Products of 1977 and 1979. ORGANIZATIONS: American Vacuum Society, American Optical Society.

Hall, Frederick F. (Dr)

(415) 854-3300

Director of Plant Engrg, Stanford Linear Accelerator, Stanford Univ, P. O. Box 4349, Stanford, CA 94305. EXPERTISE: *Power Plants, Solar Energy, Cryogenics, Vacuum, Liquid Metal Coolants, Structures and Utilities*. PAST AFFILIATIONS: Project Manager, Chas. T. Main, Inc., Boston, Mass., 1946-61. EDUCATION: Graduate, USN Midshipman School, Columbia Univ, NYC, 1945; BSME Cum Laude, Tufts Univ, 1945. PUBLICATIONS: 30 primarily in Alternate Energy Sources, Production and Use of Hydrogen as a Fuel, Cryogenics. Co-author of Four Chapters of "The Stanford Two-Mile Accelerator" R.B. Neal, Editor, 1968, W.A. Benjamin, Inc. PATENTS: 2 concerning Electrolytic Cells for Hydrogen Gas Production, 1980 and Solar Collector Including Weightless Balloon With Sun Tracking Means, 1978. ACHIEVEMENTS: Patent Work. Founder of Hydro-Sol Corp., SLAC Computer

CALIFORNIA—Cont.

Center, Cryogenic Work, Tufts Engrg Center, Production Reactor Cooling Water Plants, Power Plant Work, Registered Mechanical Engr in California, Massachusetts and Nebraska. **ORGANIZATIONS:** International Assoc. for Hydrogen Energy; The Thomas Newcomer Soc. in North America.

Hickman, Roy S. (Dr)

Prof. of Mech. Engrg., Univ. of CA, Santa Barbara, CA 93106. **EXPERTISE:** Gas Dynamics. **PAST AFFILIATIONS:** Univ. of S. CA, 1964-68; Heliopyne, 1962-64; Jet Propulsion Lab, 1961-62. **EDUCATION:** Ph.D., Univ. CA, Berkeley, 1962; B.S., Univ. CA, Berkeley, 1957. **PUBLICATIONS:** 29 primarily in Gas Dynamics. **PATENTS:** 1 concerning Shock Tube. **ACHIEVEMENTS:** 1. **ORGANIZATIONS:** ASME, AIAA, ASEE, Sigma Xi, Tau Beta Pi, Pi Tau Sigma. **HONORS/AWARDS:** Minta Martin 1956, NATO Postdoc. Fellow 1973.

Holladay, William L. (Prof) (818) 794-8732

Consulting Engineer, W.L. Holladay, 2173 Mar Vista Ave., Altadena, CA 91001. **EXPERTISE:** Low temperature refrigeration, Weather data, Energy use reduction, Refrigeration and air conditioning systems. **PAST AFFILIATIONS:** Holladay, Eggett & Helin Co-founder VP, Pres., Chairman, Sr. Consultant, 1952-1972. Hieatt Engrg. Co., VP Engrg., 1947-1952. **EDUCATION:** Southern Branch, Univ. of CA, 1920-22; CA Inst. of Tech., B.S., E.E., with honor, 1924; Grad. study, UCLA, 1956-57. **PUBLICATIONS:** 10 primarily in Pressure drop, heat transfer, weather data; refrigeration & air conditioning. **Books:** Co-author of 1, and Editor of 1. Most significant book, "Numbers" handbook for AC & Ref. engrg. **ORGANIZATIONS:** Fellow & Life Mem ASHRAE; Life Member IEEE; Tau Beta Pi. **HONORS/AWARDS:** 1950 ASRE-Wolverine Diamond Key for best publication of year; 1968-69, President, ASHRAE.

Hopf, Werner G. (Dr)

Acting Chief Engr., Conrac MTD, 9200 Bolsa, Westminster, CA 92683. **EXPERTISE:** Special Purpose Machinery, Tube Bending N.C. Machines, Bakery Machinery. **PAST AFFILIATIONS:** Machine Designer, Teledyne Pines, 1974-79; Leading Design Draftsman, Sterling Machinery, 1963-74. **EDUCATION:** Associate Degree in Drafting, Germany. **PATENTS:** 2 concerning Mechanical Design.

Howe, Everett D. (Dr)

Prof. Emeritus, Mech. Engrg., Univ. of CA, Berkeley, CA 94720. **EXPERTISE:** Desalination of water; solar energy applications. **PAST AFFILIATIONS:** Engr. Trainee, General Electric Co., 1925-27. **EDUCATION:** M.S., Mech. Engrg., 1928; B.S., Mech. Engrg., 1925. **PUBLICATIONS:** 50 primarily in Desalination of Water; Heat Transfer; Solar Energy Applications. **Books:** Author of 1. Chapters in 7 books. Most significant book, "Fundamentals of Water Desalination", Marcel Dekker, Inc., 1974. **ACHIEVEMENTS:** Established Sea Water Conversion Lab., Univ. of CA & directed work of same until retirement in 1968. **ORGANIZATIONS:** ASME, ASEE, ISES, Various honor societies. **HONORS/AWARDS:** C. G. Abbott Award, ISES.

Hoyt, Jack W. (Dr) (619) 265-4491

Professor, San Diego State Univ, Mechanical Engineering Department, San Diego, CA 92182. **EXPERTISE:** Experimental Fluid Mechanics. **PAST AFFILIATIONS:** Visiting Prof. of Mech. Engrg., Rutgers Univ., 1979-81; Naval Ocean Systems Center, San Diego, 1948-79. **EDUCATION:** Ph.D., Engrg., UCLA, 1962. **PUBLICATIONS:** 50 primarily in Fluid Mech. **PATENTS:** 6 concerning Polymer Fluid Mechanics. **ACHIEVEMENTS:** Experiments Leading to a Greater Understanding of Turbulent Flow & Cavitation in Polymer Solutions. **ORGANIZATIONS:** ASME, SNAME, N.Y. Adac. of Sci. **HONORS/AWARDS:** Freeman Scholar of ASME, 1971.

Hull, Maury L. (Dr) (916) 752-0580

Associate Professor, Univ of California, Dept. of Mech. Engrg., Davis, CA 95616. **EXPERTISE:** Experimental Mechanics, Instrumentation, Biomechanics, Machine Design and Safety, Mechanical Properties of Materials. **PAST AFFILIATIONS:** Postdoctoral Fellow, Univ of California, Berkeley, 1976; Asst. Specialist, Univ of California, Berkeley, 1975. **EDUCATION:** PhD ME, Univ of California, Berkeley, 1975; MSME, Univ of California, Berkeley, 1970; BSME, Carnegie-Mellon Univ, 1969. **PUBLICATIONS:** 50 primarily in Ski Binding Design and Function; Biomechanics of Human Power Generation; Remote Data Acquisition. **ACHIEVEMENTS:** Invented Various Actively Controlled Snow Ski Bindings; Measured the 6-Axis Boot Loading in Snow Skiing; Measured Pedal Loading during Actual Bicycling. **ORGANIZATIONS:** ASME, Sigma Xi, ASTM, Instrument Society of America, Society for Experimental Stress Analysis, International Society for Skiing Safety, American Society of Biomechanics. **HONORS/AWARDS:** Regents Faculty Fellowship, 1979 and 1980; Member, Pi Tau Sigma; ASME Student Chapter Award for Teaching Excellence, 1980-81.

Hussain, Nihad A. (Dr) (619) 265-6061

Associate Dean, Coll of Engrg, Prof, Mech Engrg, San Diego State Univ, San Diego, CA 92182. **EXPERTISE:** Heat Transfer. **PAST AFFILIATIONS:** Res. Asst., Univ of Notre Dame, 1965-69; Design Engr., AL-Damalogy Air Conditioning Consulting Engrs., Baghdad, Iraq, 1962-63. **EDUCATION:** Ph.D., Mech. Engr., Univ of Notre Dame, 1969; M.Sc., Mech. Engrg, Purdue Univ, 1965; B.Sc., Mech. Engr., Baghdad Univ, 1962. **PUBLICATIONS:** 15 primarily in Heat Transfer & Fluid Mechanics. **Tech.Reviewer:** Journal of Heat Transfer (ASME), Intl. Journal of Heat & Mass Transfer, & to the AIChE Journal. **ACHIEVEMENTS:** Devel math models for two-phase bouyant jets; obtain accurate solution to heat transfer probs associated with compact heat exchangers. **ORGANIZATIONS:** Member of the Am. Soc. of Mech. Engrs.; Member, Am. Soc. of Engrg Education; Sigma Xi, Amer. Assoc. for the Advancement of Science. **HONORS/AWARDS:** NASA-ASEE Summer Faculty Res. Fellowship for the Summers of 1973 & 1974; USAF-ASEE Summer Faculty Res. Fellowship for Summer of 1976; ASME k-19 Comm. on Environmental Heat Transfer.

Jacobs, Ralph P. (Dr)

Senior Design Engineer, Santa Fe Engrg Services, P.O. Box 1401, Orange, CA 92668. **EXPERTISE:** Mechanical engr design, Ocean engrg, Fatigue strength analysis, Experimental stress analysis. **PAST AFFILIATIONS:** Deep Oil Technology, Inc., 1975-1979. **EDUCATION:** M.S.M.E., design, Stanford Univ, 1973. **PUBLICATIONS:** 5 primarily in mechanical engrg design, oil pollution, riser fatigue testing, O.T.E.C., deepwater risers. **ACHIEVEMENTS:** Assisted in design of a free-standing production riser for 3000 feet of water; conducted computer analysis and scale model testing. **ORGANIZATIONS:** ASME, MTS, R.O.A. **HONORS/AWARDS:** Reserve Officers Association Leadership Award.

Johansen, Frederick P. (Dr)

Director of Engrg., Physics International Co., 2700 Merced St., San Leandro, CA 94577. **EXPERTISE:** Design and System Engineering, Engineering Management. **PAST AFFILIATIONS:** 1963-77, Lawrence Livermore Lab. **EDUCATION:** M.S.M.E., Univ of California, Berkeley, 1963; B.S.M.E., Stanford Univ, 1962. **PUBLICATIONS:** 15 primarily in Internal Engineering Publications, Lawrence Livermore Lab. **ACHIEVEMENTS:** Engineering Development of Nuclear Devices, Engineering Management of High Technology Engineering Teams. **ORGANIZATIONS:** ASME, American Management Association.

Jones, Brian H. (Dr)

President/General Manager, Compositek Engineering Corp. Sub. of Kelsey-Hayes Co., 6925-1 Aragon Circle, Buena Park, CA 90620. **EXPERTISE:** Composite Materials Structures. **PAST AFFILIATIONS:** Vice President-Engr. Goldsworthy Engineering Corp. 1972-1975; Consultant, Aeronautical Research Assoc. of Princeton, 1969-1972; Group Leader McDonnell Douglas Aircraft Co. 1966-1969; Lecturer, Univ.

Liverpool (UK) 1963-1966. **EDUCATION:** Ph.D., Univ. Liverpool (UK) 1965, Applied Mechanics; B. Eng. (1st CL Hons), Univ. Liverpool (UK) 1961; Higher Nat'l Certificate (Mechanical/Production), 1958. **PUBLICATIONS:** 35 primarily in Plasticity of Metals, Composite Materials, Automated Production Processes, Pressure Vessels. Contributor to Vol. 8 in, "Composite Materials", Academic Press, 1975. **PATENTS:** 5 concerning Composite Structures for Automotive Application; "Torque Transmitting Articles and Method of Making Same", 1980. **ACHIEVEMENTS:** Supervised analysis of first major structural component of Boron Composite to be test flown; dev. first mass produced filamentary overwrapped pressure vessels; designed & manufactured first successful structural comp. using composites for auto. use. **ORGANIZATIONS:** Member, American Society of Mechanical Engineers; Member, Society Plastics Industry; Member, Society of Automotive Engineers. **HONORS/AWARDS:** James Clayton Fellow (Inst of Mech. Engr.) 1961-1963; Edward Busk Scholar (Royal Aero Soc) 1961-1962; Inst. of Mechanical Engineers (London) Prizes 1958, 1957; Whitworth Society Prize (Inst. of Mech Eng/London) 1956; Technical State Scholarship (UK) 1956.

Kaeding, George G. (Dr)

Mechanical Engineer, Aerospace Company Executive TRW DSSG, One Space Park, Redondo Beach, CA 90278. **EXPERTISE:** Mechanical research and technology, Manufacturing engineering and electroexplosive devices. **PAST AFFILIATIONS:** TRW Defense & Space Systems Group, Manager, Research Technology and Manufacturing Engineering, 1976; Sr. Project Engineer, 1976; Manager, Structures Defense Systems Program, 1970-1976; Manager, Structures Ballistic Probes, 1968-70. **EDUCATION:** BSME 1974; BSEE 1975; West Coast Univ. **PUBLICATIONS:** 5 primarily in Electroexplosive devices and satellite structures. **ACHIEVEMENTS:** California Registered Prof. Engineer; Consultant, Mass., Inst. Tech. Lincoln Labs; TRW Inc., Corporate Panel Member. **ORGANIZATIONS:** Society of Manufacturing Engineers, American Defense Preparedness Association Steering Committee. **HONORS/AWARDS:** Who's Who in the West, 1978-79 & 1980-81.

Kane, Thomas R. (Dr)

Professor, Stanford Univ, Stanford, CA 94305. **EXPERTISE:** Dynamics. **PAST AFFILIATIONS:** Univ of Pennsylvania, 1953-61. **EDUCATION:** Ph.D., Applied Mech., 1953, Columbia Univ. **PUBLICATIONS:** 130 primarily in Dynamics, Vibrations. **Books:** Author of 5. "Spacecraft Dynamics", McGraw-Hill, 1983; "Dynamics - Theory and Applications", McGraw-Hill, 1985. Most significant book, "Dynamics", Holt, Rinehart & Winston, 1968; "Analytical Elements of Mechanics", Academic Press, 1959. **PATENTS:** 2 concerning Mechanisms; "Constant Speed Ratio Coupling for Shafts with Time-Varying Orientations". **ACHIEVEMENTS:** Development of a New Method for the Formulation of Equations of Motion of Dynamical Systems. **ORGANIZATIONS:** ASME, Tau Beta Pi, Sigma Xi, AAAS. **HONORS/AWARDS:** Fellow of ASME; Fellow of AAS; Dirk Brouwer Award of AAS.

Kartiala, Tauno T. (Dr)

Aircraft Structural Engrg. Consultant, General Engrg. Inc., 7136 Haskell Ave., Van Nuys, CA 91406. **EXPERTISE:** Aircraft stress fatigue and damage tolerance analysis. **PAST AFFILIATIONS:** Sr. Structures Engr, Northrop Aircraft Co., 1974-1977. **EDUCATION:** Master of Science in Mechanical Engrg, Univ of Southern California, 1974. **PUBLICATIONS:** 10 primarily in stress, fatigue, fracture mechanics. Most significant book, **ACHIEVEMENTS:** Registration as a Professional Engr in the State of California; contributed heavily to the development of the use of advanced composite structures in aircraft. **ORGANIZATIONS:** Amer. Engrg Assoc., Member.

Kays, William M. (Dr) (415) 497-3938

Prof., Dept. of Mech. Engrg. Stanford Univ, Stanford, CA 94305. **EXPERTISE:** Heat Transfer. **PAST AFFILIATIONS:** Dean, School of Engrg., 1972-84; Associate Professor, Mech. Engrg., 1954-57, Stanford Univ; Assistant Professor, Mech. Engrg., 1951-54, Stanford Univ; Research Associate, Mech. Engrg., 1947-51, Stanford Univ. **EDUCATION:** A.B. Engineering, 1942; M.S. Mechanical Engrg., 1947;

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Ph.D., Mech. Engrg., 1951 - Stanford Univ.
PUBLICATIONS: 65 primarily in Convective Heat and Mass Transfer. **Books:** Co-author of 2.
ACHIEVEMENTS: Elected Member, National Academy of Engrg., 1977; Elected Fellow, ASME, 1970; ASME Heat Transfer Div. Annual Award for Outstanding Contribution to the Science of Heat Transfer, 1965.
ORGANIZATIONS: National Academy of Engineering, ASME. **HONORS/AWARDS:** Member, Honorary Editorial, Advisory Bd of Intl Journal of Heat and Mass Transfer.

Kelly, Robert E. (Dr) (213) 825-5489

Professor, Univ of California, Los Angeles, CA 90024.
EXPERTISE: *Fluid mechanics, Convective heat transfer.*
PAST AFFILIATIONS: Rsch Geophysicist, Univ of CA, San Diego, 1966-67. **EDUCATION:** ScD, Aeronautics, MIT, 1964; Aero Eng, 1959; BSc, Aero Engr, RPI, 1957; BA, Liberal Arts, Franklin and Marshall Coll, 1957.
PUBLICATIONS: 35 primarily in Fluid Mechanics & Heat Transfer. **ORGANIZATIONS:** Fellow, APS; Amer Acad of Mechanics; ASME; SIAM; AIAA. **HONORS/AWARDS:** Exec Committee of Div of Fluid Dynamics, APS, 1978-81, Vice Chrmn, 1979-80, Chrmn, 1980-81; Sci Rsch Council Sr Vstg Fellow, Dept Math, Imperial Coll, London, 1973-74; Rsch Grants from NSF.

Kiang, Robert L. (Dr)

Sr. Research Engr., SRI International, 333 Ravenswood Ave., Menlo Park, CA 94025. **EXPERTISE:** *Theoretical and experimental fluid mechanics, Thermodynamics, Dynamics, Railroad engineering.* **PAST AFFILIATIONS:** Part-time Instr, San Jose State Univ., Research Assistant, Stanford Univ, 1965-69. **EDUCATION:** PhD, Stanford Univ, 1969. **PUBLICATIONS:** 5 primarily in Fluid Dynamics. **ACHIEVEMENTS:** Enhancement of industry's understanding of the dynamics of a number of nuclear safety systems, including post accident cooling of the Three Mile Island core.
ORGANIZATIONS: ASME, ANS.

Knapp, Karl (Dr)

Manager, Advanced Systems, Astro Research Corp., 6390 Cindy Lane, Carpinteria, CA 93013. **EXPERTISE:** *Thermophysics, Deployable Structures.* **PAST AFFILIATIONS:** President, Kardel Products Group, 1970-74. **EDUCATION:** Ph.D., Mechanical Engrg., Cal Tech, 1965; M.S. - M.E., Cal Tech, 1960.
PUBLICATIONS: 9 primarily in Large Space Structures, Heat Transfer. **PATENTS:** 2 concerning Refrigeration. **ORGANIZATIONS:** Sigma Xi, AIAA. **HONORS/AWARDS:** Special AEC Fellow Nuclear Science & Eng., 1960-63.

Kobayashi, Shiro (Dr)

Prof. of Mech. Engrg., Univ. of CA, Berkeley, CA 94720. **EXPERTISE:** *Metal flow anal.* **EDUCATION:** Ph.D., Univ. of CA, 1960; M.S., Univ. of CA, 1957; B.S., Tokyo Univ., Japan, 1946. **PUBLICATIONS:** 100 primarily in Metal forming. **Books:** Co-author of 1. **Most significant book,** "Mechanics of Plastic Deformation in Metal Processing", (co-authored), McMillan, 1965. **ORGANIZATIONS:** ASME, ASM, Japan Soc. Tech. Plasticity, CIRP, Natl. Acad. of Engrg. **HONORS/AWARDS:** ASME Blackall Machine Tool and Gage Award, Aida Engrg. Award, Japan, Miller Res. Prof., UC Berkeley, Member of Natl. Acad. of Engrg.

La Fleur, James K (Dr)

Chairman of the Board & President & Chief Executive Officer, GTI Corp., 10060 Willow Creek Rd., San Diego, CA 92131. **EXPERTISE:** *Experimental - Cryogenics Turbo Machinery Energy.* **PAST AFFILIATIONS:** Pres & Chmn of Bd, Industrial Cryogenics, Inc; Pres & Chmn of Bd, La Fleur Corp. **EDUCATION:** MBA, 1980, Pepperdine Univ., BS 1952, Ca. Inst. of Tech. **PUBLICATIONS:** 25 primarily in Cryogenics, Turbo-Machinery. **Books:** Author of 2. Several papers for ASME on Cryogenics & Gases. "Use of Turbo Machinery in the Field of Cryogenics (Gas Turbine Mag)". **Most significant book,** R & D Ltd. **Partnerships:** A Financial Breakthrough for Inventors & Small Businesses. **PATENTS:** 134 concerning

Cryogenics, Turbo-Machinery. **Liquefaction & separation of air components. ACHIEVEMENTS:** Built the First Close Cycle Gas Turbine using Helium as a Working Fluid in the Cryogenics Field - First Methane Liquefier using Cryogenics Methods. **ORGANIZATIONS:** ASME, Caltech Associates. **HONORS/AWARDS:** Outstanding Young Man, 1966; Men of Science, 1969; Reg Prof Engr, CA.

Lampert, Seymour (Dr)

Prof., Univ. of Southern CA, Los Angeles, CA 90089. **EXPERTISE:** *Solar Energy.* **PAST AFFILIATIONS:** Syst. Assoc. Inc., Vice Pres./Dir., 1967-71; Dir., Adv. Syst. Res., North Am. Aviation S&ID, 1962-67. **EDUCATION:** Ph.D., Caltech, 1954; A.E., Caltech, 1948; M.S., Caltech, 1947; B.S., GA Tech, 1943. **PUBLICATIONS:** 40 primarily in Solar Energy, Applied Mechanics, Aerodynamics, Fluid Mechanics, Socio-Economic Development, Transportation. **Books:** Author of 1. 2 Video-Tape Lectures. **Most significant book,** Solar Energy Curriculum for Elementary Schools, U.S. Dept. of Energy. **PATENTS:** 2 concerning Ballistics - "Hypervelocity LT-Gas Cartridge", 1966. **ACHIEVEMENTS:** Design & development of structures et al. for spacecraft. **ORGANIZATIONS:** ISES. **HONORS/AWARDS:** Grants from DOE.

Levy, Salomon (Dr) (408) 377-4870

President, S. Levy, Inc., 1999 S. Bascom Ave., Suite 725, Campbell, CA 95008. **EXPERTISE:** *Heat Transfer, Nuclear Power Plant Design and Safety, Energy Systems.* **PAST AFFILIATIONS:** General Manager, 1975-77, Boiling Water Reactor Operations, General Electric Co., San Jose. **EDUCATION:** PhD, 1953, Mechanical Engineering, Univ of California. **PUBLICATIONS:** 50 primarily in Heat Transfer, Nuclear Reactor Design and Safety. **Books:** Co-author of 2. **PATENTS:** 1 concerning Nuclear Reactor Design. **ORGANIZATIONS:** ASME Fellow; Member, NAE. **HONORS/AWARDS:** Member, National Academy of Engineering, 1974; Fellow, ASME, 1974; ASME Heat Transfer Memorial Award, 1966; ASME/AICHE Heat Transfer Conference Award, 1963.

Licht, Lazar (Dr)

Independent Engrg Consultant, 123 N. El Camino Real, No. 18, San Mateo, CA 94401. **EXPERTISE:** *Bearings, Air & Foil Bearings & Related Rotor Dynamics, Air & Foil Bearings in data Processing Machinery.* **PAST AFFILIATIONS:** Ampex Corp., 1965-73; IBM, 1960-64; Franklin Res. Inst., 1957-59, Sr. Res. Eng. & Proj. Leader; City Univ of New York & New York Univ Lecturer, 1952-54; Columbia Univ, Mech. Eng., Post Doctoral Res., 1964-65. **EDUCATION:** D.Eng.Sc., Mech. Eng., Columbia Univ; M.S., Mech. Eng., Columbia; B.S., Mech. Eng., Columbia. **PUBLICATIONS:** 28 primarily in Bearings, Air Bearings, Rotor Dynamics, Transport of Flexible Media. **PATENTS:** 7 concerning Air & Foil Bearings, Turbomachinery & Electronic Data Processing, Anti-whirl Fluid Bearings, Journal and Thrust Bearings, Transport Mechanisms for Flexible Materials. **ACHIEVEMENTS:** Dev. of a Flexible (Foil Bearing) Support System for High Speed Turborotors. **ORGANIZATIONS:** ASME, RESA, Sigma Xi. **HONORS/AWARDS:** Sr. U.S. Scientist Award, Alexander v. Humboldt Foundation, 1975; Higgins Fellowship & Boese Fellowship, 1952-54, from Columbia Univ.

Lipson, Marvin S. (Dr)

Program Mgr., Aerojet Liquid Rocket Co., PO Box 13222, Sacramento, CA 95813. **EXPERTISE:** *Aerospace Propulsion.* **PAST AFFILIATIONS:** 1960-61, Hamilton Standard Div. of United Technology Corp.; 1956-60, Convair Div. (Ft. Worth) of General Dynamics Corp. **EDUCATION:** BSME, Mech. Engrg., LA State Univ., 1956. **ACHIEVEMENTS:** Selected as most valuable contributor to the success of the Stage I & II Propulsion Systems on the Voyager & Viking Missions in Space. **ORGANIZATIONS:** Pi Tau Sigma; Air Force Assn. **HONORS/AWARDS:** Pi Tau Sigma.

Lucas, Robert Gillem (Dr) (619) 280-6201

Managing Partner, Gillem Lucas & Associates, 4703 Murat Pl, San Diego, CA 92117. **EXPERTISE:** *Nuclear Plant Operation, Mechanical Engineering, PAST AFFILIATIONS:* Lieutenant Commander, U.S. Navy Nuclear Submarine Force, 1968-78. **EDUCATION:** B.S., U. S. Naval Academy, Mathematics, 1968; Stanford Graduate School of Business, MBA, 1981. **ACHIEVEMENTS:** Selected as Engineer Officer of Nuclear Submarine by Naval Reactors Division of Energy Research and Development Agency. **ORGANIZATIONS:** California Society of Professional Engineers.

Ma, Joseph T. (Dr) (408) 256-2116

Sr. Technical Staff Member and Manager, Adv. Tech, CPD, IBM Corporation, 5600 Cottle Road, San Jose, CA 95193. **EXPERTISE:** *Applied Mechanics, Magnetics, Computer Peripherals.* **PAST AFFILIATIONS:** Assistant Prof., Iowa State Univ, 1956-59. **EDUCATION:** Ph.D., Mech. Engrg., Iowa State Univ, 1959. **PUBLICATIONS:** 10 primarily in Applied Mechanics, Computer Science, Servo Systems. **Books:** Editor of 1. **PATENTS:** 4 concerning Servo Mechanism, Magnetic Transducers, Display Graphics System. **ACHIEVEMENTS:** The Achievement of Sr. Technical Staff Member Position for Recognition of Technical Contributions. **ORGANIZATIONS:** Sr. Member, IEEE; Fellow, ASME; Member, Texas Prof. Engineers. **HONORS/AWARDS:** Fellow, Advanced Engineering Study, MIT; Tau Beta Pi; IBM Invention Award; IBM Outstanding Innovation Award.

Maloney, Kenneth L. (Dr)

Director, Product Development, KVB, Inc., 18006 Sky Park Blvd., Irvine, CA 95714. **EXPERTISE:** *Combustion Technology & Energy Utilization; Emission Control From Gas-Oil-Coal-Fired Systems.* **EDUCATION:** Ph.D., Penn State Univ, Fuel Science. **PUBLICATIONS:** 15 primarily in Combustion, Kinetics, Furnaces, Boiler Emission Control. **ACHIEVEMENTS:** Studies into Method to Capture Sulfur in Coal Flames; Define Cond where Capturer is Most Effective; Invent, patent syst to improve effc & reduce pollutant emissions from stoker fired boilers; Consult, Expert Witness re coal bunker fires aboard ships. **ORGANIZATIONS:** American Chemical Society, Sigma Xi, Air Pollution Control Association, Combustion Institute.

Manvi, Ram (Dr) (213) 224-3541

Dean, School of Engineering & Technology, California State University, 5151 State University Dr., Los Angeles, CA 90032. **EXPERTISE:** *Solar Thermal Systems, Thermal Energy Storage, Advanced Energy Conversion, Cogeneration.* **PAST AFFILIATIONS:** Mem Tech Staff, Jet Propulsion Lab; Sr Scientific Officer, Atomic Energy Commission, India, 1958-64. **EDUCATION:** PhD, Mech Engr, Washington State Univ, 1964; BE, Mech Engr, Osmania Univ, 1958. **PUBLICATIONS:** 51 primarily in energy systems, heat transfer, thermal systems engrg. **ACHIEVEMENTS:** Project Mgr at Atomic Energy Estab. Trombay, India; Managed Radio-Isotope Prod Plant; Mgr, Cogeneration Tech Study at JPL; Mgr, Thermal Energy Storage, JPL; Reg Prof Engr, CA. **ORGANIZATIONS:** Mem ASME, ASEE; Sigma Xi; Pi Tau Sigma; Tau Beta Pi; Phi Kappa Phi. **HONORS/AWARDS:** NASA Certif of Recognition.

Marcus, Bruce D. (Dr) (213) 535-7897

Project Manager, TRW Space and Technology Group, One Space Park, Redondo Beach, CA 90278. **EXPERTISE:** *High Energy Excimer Lasers, Heat Pipes, Heat and Mass Transfer, Phase Change Phenomena.* **PAST AFFILIATIONS:** Post Doctoral Fellow, T.H. te DELFT, Netherlands, 1963-64. **EDUCATION:** PhD, Thermal Processes, 1963; MME, Nuclear/Thermal Engrg, 1959; BME, Thermal Processes, 1959; all Cornell Univ. **PUBLICATIONS:** 30 primarily in heat pipes, boiling heat transfer, change of phase. **PATENTS:** 4 concerning heat pipes. **ACHIEVEMENTS:** Development of variable conductance heat pipes; contributed to the understanding of Nucleate Pool Boiling. **ORGANIZATIONS:** ASME; AIAA; Tech Marketing Soc of Amer. **HONORS/AWARDS:** Pi Tau Sigma; Phi Kappa Phi; Sigma Xi; Three NASA New Tech Awards; NSF, AEC Fellowships.