

Structural Analysis And Synthesis Answer Key

This book provides step-by-step instructions on how to analyze text generated from in-depth interviews and focus groups, relating predominantly to applied qualitative studies. The book covers all aspects of the qualitative data analysis process, employing a phenomenological approach which has a primary aim of describing the experiences and perceptions of research participants. Similar to Grounded Theory, the authors' approach is inductive, content-driven, and searches for themes within textual data. Structural Analysis and Synthesis is the best-selling laboratory manual of its kind. Specifically designed to support the laboratory work of undergraduates in structural geology courses, the book helps students analyze the various aspects of geological structures, and to combine their analyses into an overarching synthesis. This book is intended for use in the laboratory portion of a first course in structural geology. As is explicit in the title, this book is concerned with both the analysis and synthesis of structural features. In this 4th edition, the focus of this popular manual has been broadened to include a range of new content and features, including: Video content which demonstrates visually how to perform some of the more challenging structural geology techniques An acknowledgement of the increasing importance of environmental applications of structural geology – vital to students who may go on to pursue careers in the environmental sphere An increased emphasis on quantitative techniques, complete with descriptions of computer program applications Contingent with this quantitative emphasis, the book also outlines the limitations of such techniques, helping students to appropriately apply the techniques and evaluate their trustworthiness Structural Analysis and Synthesis, 4th edition is a renowned and widely recognized aid to students in grasping and mastering the techniques required in structural geology, and will find a home wherever the principles and practices of structural geology are taught.

Combining theoretical knowledge of synthetic transformations, practical considerations, structural elucidation by interpretation of spectroscopic data as well as rationalization of structure-property relations, this textbook presents a series of 16 independent exercises, including detailed descriptions of experimental procedures, questions, and answers. The experimental descriptions are very helpful for guiding less experienced students towards a better understanding of practical aspects in synthetic organic chemistry, while the broad scope of the questions and answers is excellent for learning purposes. The exercises are based on published research articles, adapted for didactic purposes, and will thus inspire students by way of having to solve real-life problems in chemistry. A must-have for MSc and PhD students as well as postdocs in organic chemistry and related disciplines, and lecturers and organizers of lab courses in organic chemistry.

Design, Synthesis, Structural Analysis and Cation Binding of Macrocyclic Hydropyran Oligolides
Synthesis and Structural Analysis of Platinum-telluride Compounds and Platinum-mixed Metal Clusters
Solutions manual

Papers Presented at the Symposium on Future Trends in Computerized Structural Analysis and Synthesis,
Held on 30 October-1 November 1978 at Washington, D.C.

Pathways to Health Equity

A Structural Analysis of Complex Aerial Photographs

Compilers and operating systems constitute the basic interfaces between a programmer and the machine for which he is developing software. In this book we are concerned with the construction of the former. Our intent is to provide the reader with a firm theoretical basis for compiler construction and sound engineering principles for selecting alternate methods, implementing them, and integrating them into a reliable, economically viable product. The emphasis is upon a clean decomposition employing modules that can be re-used for many compilers, separation of concerns to facilitate team programming, and flexibility to accommodate hardware and system constraints. A reader should be able to understand the questions he must ask when designing a compiler for language X on machine Y, what tradeoffs are possible, and what performance might be obtained. He should not feel that any part of the design rests on whim; each decision must be based upon specific, identifiable characteristics of the source and target languages or upon design goals of the compiler. The vast majority of computer professionals will never write a compiler. Nevertheless, study of compiler technology provides important benefits for almost everyone in the field . • It focuses attention on the basic relationships between languages and machines. Understanding of these relationships eases the inevitable transitions to new hardware and programming languages and improves a person's ability to make appropriate tradeoffs in design and implementation .

Readers learn to master the basic principles of structural analysis using the classical approach found in Kassimali's distinctive STRUCTURAL ANALYSIS, 6th Edition. This edition presents structural analysis concepts in a logical order, progressing from an introduction of each topic to an analysis of statically determinate beams, trusses and rigid frames, and then to the analysis of statically indeterminate structures. Practical, solved problems integrated throughout each presentation help illustrate and clarify the book's fundamental concepts, while the latest examples and timely content reflect today's most current professional standards. Kassimali's STRUCTURAL ANALYSIS, 6th Edition provides the foundation needed for advanced study and professional success. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

The Leading Integrated Chemical Process Design Guide: Now with New Problems, New Projects, and More More than ever, effective design is the focal point of sound chemical engineering. Analysis, Synthesis, and Design of Chemical Processes, Third Edition, presents design as a creative process that integrates both the big picture and the small details – and knows which to stress when, and why. Realistic from start to finish, this book moves readers beyond classroom exercises into open-ended, real-world process

problem solving. The authors introduce integrated techniques for every facet of the discipline, from finance to operations, new plant design to existing process optimization. This fully updated Third Edition presents entirely new problems at the end of every chapter. It also adds extensive coverage of batch process design, including realistic examples of equipment sizing for batch sequencing; batch scheduling for multi-product plants; improving production via intermediate storage and parallel equipment; and new optimization techniques specifically for batch processes. Coverage includes Conceptualizing and analyzing chemical processes: flow diagrams, tracing, process conditions, and more Chemical process economics: analyzing capital and manufacturing costs, and predicting or assessing profitability Synthesizing and optimizing chemical processing: experience-based principles, BFD/PFD, simulations, and more Analyzing process performance via I/O models, performance curves, and other tools Process troubleshooting and “ debottlenecking ” Chemical engineering design and society: ethics, professionalism, health, safety, and new “ green engineering ” techniques Participating successfully in chemical engineering design teams Analysis, Synthesis, and Design of Chemical Processes, Third Edition, draws on nearly 35 years of innovative chemical engineering instruction at West Virginia University. It includes suggested curricula for both single-semester and year-long design courses; case studies and design projects with practical applications; and appendixes with current equipment cost data and preliminary design information for eleven chemical processes – including seven brand new to this edition.

Synthesis of Electron Dense Labels and Structural Analysis of Multiprotein Aggregates

Trends in Computerized Structural Analysis and Synthesis

Unitary Analysis, Synthesis, and Classification of Flow Meters

Natural Products Analysis

The logic of chemical synthesis

Essentials of Glycobiology

This book is the first to present flow measurement as an independent branch of the measurement techniques, according to a new global and unitary approach for the measurement of fluid flow field, starting from finding its unitary fundamental bases. Furthermore, it elaborates the method of unitary analysis/synthesis and classification of compound gauging structures (CGS): the UASC – CGS method. These methods ensure, in a systematic and predictable way, both the analysis of the types of flow meters made until present (i.e. CGS) and the synthesis of new types of flowmeters. The book outlines new contributions in this field, including separately, for flow meters, and CGS: structural schemes and their unitary, unitary classification, unitary logical matrix, method of unitary analysis/synthesis and classification.

The authors and their colleagues developed this text over many years, teaching undergraduate and graduate courses

in structural analysis courses at the Daniel Guggenheim School of Aerospace Engineering of the Georgia Institute of Technology. The emphasis is on clarity and unity in the presentation of basic structural analysis concepts and methods. The equations of linear elasticity and basic constitutive behaviour of isotropic and composite materials are reviewed. The text focuses on the analysis of practical structural components including bars, beams and plates. Particular attention is devoted to the analysis of thin-walled beams under bending shearing and torsion. Advanced topics such as warping, non-uniform torsion, shear deformations, thermal effect and plastic deformations are addressed. A unified treatment of work and energy principles is provided that naturally leads to an examination of approximate analysis methods including an introduction to matrix and finite element methods. This teaching tool based on practical situations and thorough methodology should prove valuable to both lecturers and students of structural analysis in engineering worldwide. This is a textbook for teaching structural analysis of aerospace structures. It can be used for 3rd and 4th year students in aerospace engineering, as well as for 1st and 2nd year graduate students in aerospace and mechanical engineering.

This book updates the latest development in production, stabilization and structural analysis techniques of membrane proteins. This field has made significant advances since the elucidation of the first 3-D structure of a recombinant G Protein Coupled Receptor (GPCR), rhodopsin, with the structure of several more GPCRs having been solved in the past five years. In fact, the 2012 Nobel Prize in Chemistry was awarded for groundbreaking discoveries on the inner workings of GPCRs. This book is essential reading for all researchers, biochemists and crystallographers working with membrane proteins, who are interested by the structural characterization of their favorite protein and who wish to follow the expression, migration, modifications and recycling of a membrane protein.

Research-in-progress Papers Presented at a Symposium Cosponsored by NASA Langley Research Center Hampton, Virginia, and the George Washington University, Washington, D. C., in Cooperation with the National Science Foundation and the American Society of Civil Engineers, and Held at Washington, D. C., October 30-November 1, 1978
Research in Computerized Structural Analysis and Synthesis

Notes on the Synthesis of Form

Challenges for Chemistry and Chemical Engineering

Generalized Blockmodeling

Dependency-based methods for syntactic parsing have become increasingly popular in natural language processing in recent years. This book gives a thorough introduction to the methods that are most widely used today. After an introduction to dependency grammar and

dependency parsing, followed by a formal characterization of the dependency parsing problem, the book surveys the three major classes of parsing models that are in current use: transition-based, graph-based, and grammar-based models. It continues with a chapter on evaluation and one on the comparison of different methods, and it closes with a few words on current trends and future prospects of dependency parsing. The book presupposes a knowledge of basic concepts in linguistics and computer science, as well as some knowledge of parsing methods for constituency-based representations. Table of Contents: Introduction / Dependency Parsing / Transition-Based Parsing / Graph-Based Parsing / Grammar-Based Parsing / Evaluation / Comparison / Final Thoughts

This market-leading textbook has been fully updated in response to extensive user feedback. It includes a new chapter on joints and veins, additional examples from around the world, stunning new field photos, and extended online resources with new animations and exercises. The book's practical emphasis, hugely popular in the first edition, features applications in the upper crust, including petroleum and groundwater geology, highlighting the importance of structural geology in exploration and exploitation of petroleum and water resources. Carefully designed full-colour illustrations work closely with the text to support student learning, and are supplemented with high-quality photos from around the world. Examples and parallels drawn from practical everyday situations engage students, and end-of chapter review questions help them to check their understanding. Updated e-learning modules are available online (www.cambridge.org/fossen2e) and further reinforce key topics using summaries, innovative animations to bring concepts to life, and additional examples and figures. This book provides an integrated treatment of generalized blockmodeling appropriate for the analysis network structures.

Structural Geology

Achievements and Opportunities

Compiler Construction

Automated transient analysis of structural members

Multi-Step Organic Synthesis

Research-in-progress Papers Presented at a Symposium Cosponsored by NASA Langley Research Center and the George Washington University, in Cooperation with the National Science Foundation and the American Society of Civil Engineers, and Held at Washington, D.C., October 30 - November 1, 1978

Praise for the first edition: "This excellent text will be useful to every system engineer (SE) regardless of the domain. It covers ALL relevant SE material and does so in a very clear, methodical fashion. The breadth and depth of the author's presentation of SE principles and practices is outstanding." –Philip Allen ***This textbook presents a comprehensive, step-by-step guide to System Engineering analysis, design, and development via an integrated set of concepts, principles, practices, and methodologies. The methods presented in this text apply to any type of human system -- small, medium, and large organizational systems and system development projects delivering engineered systems or services across multiple business sectors such as medical, transportation, financial, educational, governmental, aerospace and defense, utilities, political, and charity, among others. Provides a common focal point for "bridging the gap" between and unifying System Users, System Acquirers, multi-discipline System Engineering, and Project, Functional, and Executive Management education, knowledge, and decision-making for developing systems, products, or services Each chapter provides definitions of key terms, guiding principles, examples, author's notes, real-world examples, and exercises, which highlight and reinforce key SE&D concepts and practices*** ***Addresses concepts employed in Model-Based Systems Engineering (MBSE), Model-Driven Design (MDD), Unified Modeling Language (UMLTM) / Systems Modeling Language (SysMLTM), and Agile/Spiral/V-Model Development such as user needs, stories, and use cases analysis;***

specification development; system architecture development; User-Centric System Design (UCSD); interface definition & control; system integration & test; and Verification & Validation (V&V) Highlights/introduces a new 21st Century Systems Engineering & Development (SE&D) paradigm that is easy to understand and implement. Provides practices that are critical staging points for technical decision making such as Technical Strategy Development; Life Cycle requirements; Phases, Modes, & States; SE Process; Requirements Derivation; System Architecture Development, User-Centric System Design (UCSD); Engineering Standards, Coordinate Systems, and Conventions; et al. Thoroughly illustrated, with end-of-chapter exercises and numerous case studies and examples, Systems Engineering Analysis, Design, and Development, Second Edition is a primary textbook for multi-discipline, engineering, system analysis, and project management undergraduate/graduate level students and a valuable reference for professionals.

Function minimization methods in structural analysis and optimum design are discussed. A computer program which implements the energy search method of nonlinear finite element analysis is presented. Several recent weight optimization methods based on finite element analysis are reviewed. Special characteristics of the finite element method relevant to automated design are identified. Some efficient approximate analysis methods for optimization applications are explored. Applications of some of these methods to plane frames and finite-deflection trusses are presented.

This book highlights analytical chemistry instrumentation and practices applied to the analysis of natural products and their complex mixtures, describing techniques for isolating and characterizing natural products. • Applies analytical techniques to natural products research – an area of critical importance to drug discovery • Offers a one-stop shop for most analytical methods: x-ray diffraction, NMR analysis, mass spectrometry, and chemical genetics • Includes coverage of natural products basics and highlights antibacterial research, particularly important as efforts to combat drug resistance gain prominence • Covers instrumental techniques with enough detail for both current practitioners and beginning researchers

Things Fall Apart

A Guide Through Experiments

Answer Book

An Introduction to Structural Geology and Tectonics

Earth Structures

Synthesis, Verification, and Test

This thesis focuses on the first synthesis and application of planar-chiral [2.2]paracyclophane- derived hydrogen-bond donor catalysts, thereby inducing a unique chiral motif into the emerging field of thiourea organocatalysis. Reaction acceleration through hydrogen-bond catalysis has made a significant impact on the field, rendering the development of potent catalyst structures extremely valuable. Based on the [2.2]paracyclophane scaffold, mono- and bi-functional thiourea catalysts were prepared. The rigidity of the [2.2]paracyclophane structure leads to a unique setup of the substituents. In pseudo-geminal position to the thiourea moiety, a hydroxy group was selected and introduced as the second functionality. In a 12-step synthesis, the enantiopure hydroxy-substituted [2.2]paracyclophanylene thiourea was obtained. Furthermore, efficient access to enantiopure pseudo-geminally substituted 13-amino-4-bromo[2.2]paracyclophane was developed. The aminobromide was employed in cross-coupling reactions to yield arylated amino[2.2]paracyclophanes, exhibiting a broad range of electronic and steric features useful for organocata

applications. The developed catalysts were applied in asymmetric organic transformations and proved most useful in transfer hydrogenation reaction. The hydroxy-substituted thiourea catalyst particularly exhibited catalytic activity and stereoselectivity. To shed light on the mode of action of this class of hydrogen-bond catalysts, various analytic methods were conducted. Through extensive crystallographic and NMR complexation experiments, the binding properties of the catalysts were investigated in terms of their interaction with hydrogen-bond-accepting functional groups. Furthermore, quantum chemical DFT and ab initio calculations were undertaken to explore the favored conformations of [2.2]paracyclophane-derived thioureas. The combined findings revealed substrate-dependent activation via single or double hydrogen bonding between the NH groups of the thiourea and the respective substrate. Furthermore, a class of readily accessible hydrogen-bond thiourea catalysts was developed, derived from amino acids. Their steric and electronic features were modulated by their degree of substitution at the carbinol carbon center. All catalysts were applied in asymmetric transfer hydrogenation of nitroolefins, furnishing the products in up to 99% yield and 87% enantiomeric excess.

This widely used, highly readable introduction to structural analysis is specifically designed to support the laboratory of undergraduates in structural geology courses. The new third edition includes: New and amended exercises and redrafted figures to improve clarity A single fold-out map of the Bree Creek Quadrangle – a mythical site used to help students analyze various aspects of the geologic structures exposed within this quadrangle and ultimately to develop a grand synthesis A user-friendly spiral binding ideal for work in the lab or out in the field An Instructor manual CD-ROM this title is available. Please contact our Higher Education team at HigherEducation@wiley.com for more information.

Chemistry and chemical engineering have changed significantly in the last decade. They have broadened their scope into biology, nanotechnology, materials science, computation, and advanced methods of process systems engineering and control so much that the programs in most chemistry and chemical engineering departments now barely resemble the classical notion of chemistry. Beyond the Molecular Frontier brings together research, discovery and invention across the entire spectrum of the chemical sciences from fundamental, molecular-level chemistry to large scale chemical processing technology. This reflects the way the field has evolved, the synergy at universities between research and education in chemistry and chemical engineering, and the way chemists and chemical engineers work together in industry. The astonishing developments in science and engineering during the 20th century have made it possible to dream of new goals that might previously have been considered unthinkable. This book identifies the key opportunities and challenges for the chemical sciences, from basic research to societal needs and from terrorism de

to environmental protection, and it looks at the ways in which chemists and chemical engineers can work together to contribute to an improved future.

Structural Analysis

With Applications to Aerospace Structures

Membrane Proteins Production for Structural Analysis

A Laboratory Course in Structural Geology

Analysis, Synthesis and Design of Chemical Processes

Planar-Chiral Hydrogen-Bond Donor Catalysts

In the United States, some populations suffer from far greater disparities in health than others. Those disparities are caused not only by fundamental differences in health status across segments of the population, but also because of inequities in factors that impact health status, so-called determinants of health. Only part of an individual's health status depends on his or her behavior and choice; community-wide problems like poverty, unemployment, poor education, inadequate housing, poor public transportation, interpersonal violence, and decaying neighborhoods also contribute to health inequities, as well as the historic and ongoing interplay of structures, policies, and norms that shape lives. When these factors are not optimal in a community, it does not mean they are intractable: such inequities can be mitigated by social policies that can shape health in powerful ways. Communities in Action: Pathways to Health Equity seeks to delineate the causes of and the solutions to health inequities in the United States. This report focuses on what communities can do to promote health equity, what actions are needed by the many and varied stakeholders that are part of communities or support them, as well as the root causes and structural barriers that need to be overcome.

The trend in structural analysis in the past two decades has been the development of the finite element methodology. The state-of-the-art of the finite element method is such that most linear structural problems can be solved, provided time and cost are not of concern. For many engineering problems of interest to the Navy, a finite element model may not be as appropriate as a structural member model. The latter may be adequate and, indeed, even more accurate. Hence, there is a pressing need for efficient, accurate structural member solutions. The goal of this project has been to develop structural member dynamic response technology so that it is as reliable as static response methodology, even for complex geometric, material, and loading situations. The technology being developed is computational. Reanalysis formulations, which were developed primarily for discrete systems, are extended to structural members. Studies of design sensitivity, synthesis for prescribed dynamic characteristics, and optimizations under dynamic constraints were performed.

This instructive, engaging, highly readable manual is intended for the laboratory portion of an undergraduate course in structural geology. Guided by students' and instructors' suggestions, Dr Stephen Rowland and his new co-author, Dr Ernest Duebendorfer, have refined various exercises for the second edition, and have added discussions of numerous topics, including axial planar foliations and the dip

isogon methods of fold classification. There are also three new chapters on: balanced cross sections; deformation mechanisms, fault kinematics and microstructures; and plate tectonics.

Synthesis, Application and Structural Analysis

Beyond the Molecular Frontier

Molecular Biology of the Cell

Structural Analysis and Synthesis

Communities in Action

Dependency Parsing

This book provides broad and comprehensive coverage of the entire EDA flow. EDA/VLSI practitioners and researchers in need of fluency in an "adjacent" field will find this an invaluable reference to the basic EDA concepts, principles, data structures, algorithms, and architectures for the design, verification, and test of VLSI circuits. Anyone who needs to learn the concepts, principles, data structures, algorithms, and architectures of the EDA flow will benefit from this book. Covers complete spectrum of the EDA flow, from ESL design modeling to logic/test synthesis, verification, physical design, and test - helps EDA newcomers to get "up-and-running" quickly Includes comprehensive coverage of EDA concepts, principles, data structures, algorithms, and architectures - helps all readers improve their VLSI design competence Contains latest advancements not yet available in other books, including Test compression, ESL design modeling, large-scale floorplanning, placement, routing, synthesis of clock and power/ground networks - helps readers to design/develop testable chips or products Includes industry best-practices wherever appropriate in most chapters - helps readers avoid costly mistakes

It is most appropriate that the first volume to appear in the series "Advanced Applications in Pattern Recognition" should be this monograph by Nagao and Matsuyama. The work described here is a deep unification and synthesis of the two fundamental approaches to pattern recognition: numerical (also known as "statistical") and structural ("linguistic," "syntactic"). The power and unity of the methodology flow from the apparently effortless and natural use of the knowledge-base framework illuminated by the best results of artificial intelligence research. An integral part of the work is the

algorithmic solution of many hitherto incompletely or clumsily treated problems. It was on the occasion of a laboratory visit in connection with the 4th IJCPR (of which Professor Nagao was the very able Program Chairman) that I saw in operation the system described here. On the spot I expressed the desire to see the work described for the international technical audience in this series and the authors were kind enough to agree to contribute to a new and unknown series. With the publication of this monograph on the eve of the 5th ICPR my wish is fulfilled. I want to thank here the authors and Plenum Publishing Corporation for making this volume and the series a reality.

Sugar chains (glycans) are often attached to proteins and lipids and have multiple roles in the organization and function of all organisms. "Essentials of Glycobiology" describes their biogenesis and function and offers a useful gateway to the understanding of glycans.

Concepts, Principles, and Practices

Developments in Structural Analysis and Synthesis by Function Minimization

Hybrid Computer Methods of Structural Analysis and Synthesis

Structural Analysis and Synthesis: A Laboratory Course in Structural Geology, Second Edition

The Behavioral and Social Sciences

Applied Thematic Analysis

Structural Analysis and Synthesis Answer Book Wiley-Blackwell Structural Analysis and Synthesis: A Laboratory Course in Structural Geology, Second Edition Wiley

The Second Edition also benefits from new artwork that clearly illustrates complex concepts. New to the Second Edition: New Chapter: 15, "Geophysical Imaging," by Frederick Cook Within Chapters 21 and 22, four new essays on "Regional Perspectives" discuss the European Alps, the Altids, the Appalachians, and the Cascadia Wedge. New and updated art for more informative illustration of concepts. The Second Edition now has 570 black & white figures.

"These notes are about the process of design: the process of inventing things which display new physical order, organization, form, in response to function." This book, opening with these words, presents an entirely new theory of the process of design. In the first part of the book, Christopher Alexander discusses the process by which a form is adapted to the context of human needs and demands that has called it into being. He shows that such an adaptive process will be successful only if it proceeds piecemeal instead of all at once. It is for this reason that forms from traditional un-self-conscious cultures, molded not by designers but by the slow pattern of changes within tradition, are so

beautifully organized and adapted. When the designer, in our own self-conscious culture, is called on to create a form that is adapted to its context he is unsuccessful, because the preconceived categories out of which he builds his picture of the problem do not correspond to the inherent components of the problem, and therefore lead only to the arbitrariness, willfulness, and lack of understanding which plague the design of modern buildings and modern cities. In the second part, Mr. Alexander presents a method by which the designer may bring his full creative imagination into play, and yet avoid the traps of irrelevant preconception. He shows that, whenever a problem is stated, it is possible to ignore existing concepts and to create new concepts, out of the structure of the problem itself, which do correspond correctly to what he calls the subsystems of the adaptive process. By treating each of these subsystems as a separate subproblem, the designer can translate the new concepts into form. The form, because of the process, will be well-adapted to its context, non-arbitrary, and correct. The mathematics underlying this method, based mainly on set theory, is fully developed in a long appendix. Another appendix demonstrates the application of the method to the design of an Indian village.

System Engineering Analysis, Design, and Development

Instrumentation, Methods, and Applications

Electronic Design Automation

Network Analysis and Synthesis

Okonkwo is the greatest warrior alive, famous throughout West Africa. But when he accidentally kills a clansman, things begin to fall apart. Then Okonkwo returns from exile to find missionaries and colonial governors have arrived in the village. With his world thrown radically off-balance he can only hurtle towards tragedy. Chinua Achebe's stark novel reshaped both African and world literature. This arresting parable of a proud but powerless man witnessing the ruin of his people begins Achebe's landmark trilogy of works chronicling the fate of one African community, continued in Arrow of God and No Longer at Ease.

This volume explores the scientific frontiers and leading edges of research across the fields of anthropology, economics, political science, psychology, sociology, history, business, education, geography, law, and psychiatry, as well as the newer, more specialized areas of artificial intelligence, child development, cognitive science, communications, demography, linguistics, and management and decision science. It includes recommendations concerning new resources, facilities, and programs that may be needed over the next several years to ensure rapid progress and provide a high level of returns to basic research.