CUNY ADVANCED SCIENCE RESEARCH CENTER

Strategic Plan 2013-2017

A New Era of Scientific Inquiry at CUNY

CUNY

Scientific literacy is a sine qua non of an educated citizenry. But too few Americans are pursuing educations and careers in science, technology, engineering and mathematics. Now more than ever, our country and our city depend on science-related discoveries and ingenuity to drive industry, business and economic vibrancy.

— Chancellor Matthew Goldstein

From the Chancellor and the Vice Chancellor for Research

We are pleased to present the CUNY Advanced Science Research Center's first strategic plan. The ASRC is scheduled to be operational in 2014—the culmination of a decade of ambitious planning and investment.

From the earliest stages of planning, we envisioned the Advanced Science Research Center as a different kind of science building—one where researchers mingle, ideas flow freely, and collaborations, even unlikely ones, form among scientists with divergent expertise but complementary interests. It was designed to enable those in different disciplines to work together on common research pursuits. Indeed, in recruiting the directors of the ASRC's five strategic areas—the environment, nanotechnology, photonics, structural biology, and neuroscience—we focused not only on the specifics of their research interests but also on their commitment to creative collaboration.

This is especially critical because the ASRC will be a University-wide center that taps into the depth and diversity of CUNY's research talent. More than 50 faculty researchers from across the CUNY cam¬puses participated in planning the center, and faculty already working on the flagship initiatives at CUNY's colleges will be a major presence at the ASRC. CUNY faculty will be able to use the ASRC's nuclear imaging facilities and cryo-electron microscopes. They will access its state-of-the-art clean room for nanotechnology instead of traveling to places like Brookhaven National Laboratory, some 65 miles away. The center's visualization room, with a wall of screens and a data-analysis center, will be open to CUNY scientists, allowing a structural biologist to look at crystal structures in 3D and a neuroscientist to see electrophysiological brain studies. In addition, CUNY faculty researchers will be able to apply for space on a project basis, perhaps for study during the month between semesters or to take a sabbatical to complete a project at the ASRC. Post-docs can apply to be housed at the ASRC for a period of time, and there will be many opportunities for students to work there on projects with faculty.

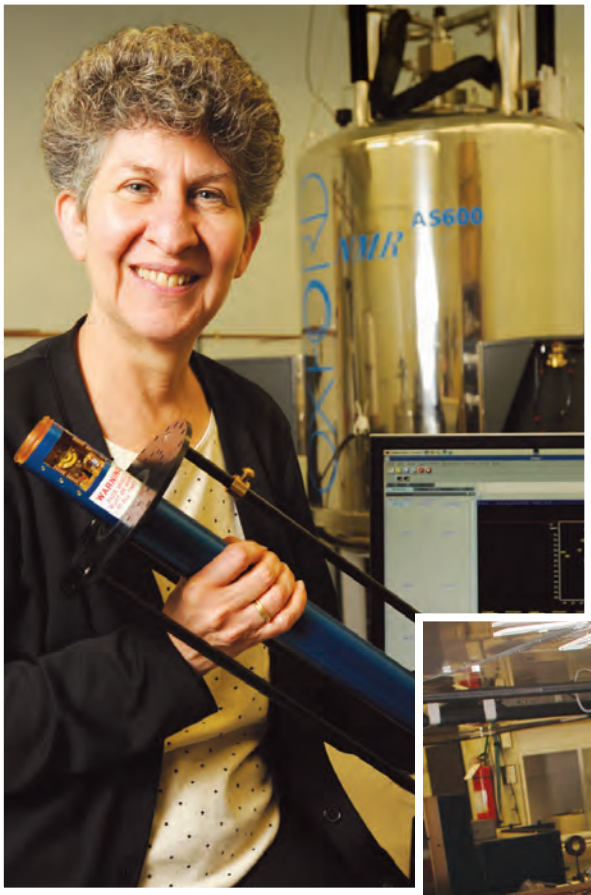
As the center of science at the nation's premier public urban university, the ASRC will extend its spirit of education beyond the University. Its Science Discovery and Education Center, featuring interactive displays of the work underway inside the building, is designed to stimulate the interest of high school students in high-level science and serve as a resource for teachers. Other outreach activities, including discussions and panels for the general public by ASRC scientists, are also planned.

We look forward to these and the many other exciting collaborations generated by the ASRC, all leading to the advancement of cutting-edge research and discovery at The City University of New York.

Sincerely,

Matthew Goldstein
Chancellor

Gillian Small
Vice Chancellor for Research
Executive Director of the
Advanced Science Research Center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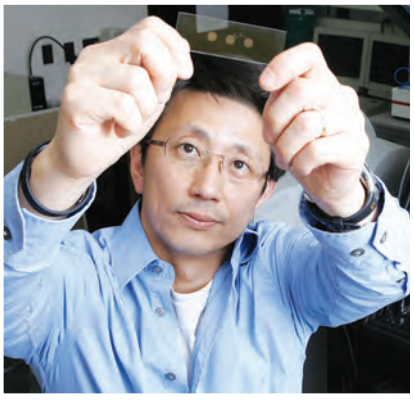

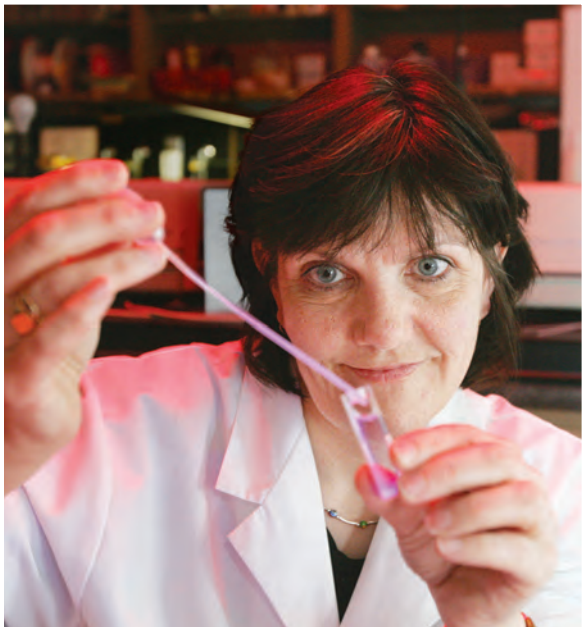

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The ASRC is rapidly taking shape at the southern edge of City College in Upper Manhattan. The $350-million building will open in the fall of 2014.

Overview

In a global economy increasingly driven by science and technology, the United States faces an unaccustomed but urgent challenge. American students lag behind their international peers in science and math proficiency, a trend that threatens the nation's leadership in cutting-edge research and undermines its economic fortunes. American businesses export hundreds of thousands of jobs because there isn't enough technical talent at home to fill them. In New York State, a recent study found there are nearly two open science-related jobs for every unemployed person in the state.

Over the past several years, The City University of New York has made a massive commitment aimed squarely at the national and regional need to expand science education and attract more young people to careers in research, technology and engineering.

CUNY's "Decade of Science" has been a multibillion-dollar investment in faculty and facilities that has elevated science across the CUNY landscape. The widely praised initiative has improved the quality and availability of science at all academic levels of public higher education in New York City. It is expanding the pipeline of students who graduate and enter the workforce with degrees or backgrounds in the fields collectively known as STEM — science, technology, engineering and mathematics. And it has stirred a rebirth of CUNY's legacy as a university renowned for great science. The current generation of CUNY researchers is at the forefront of some of the most vital scientific challenges of our time.

Now the expanding universe of science is leading to a landmark moment: The opening, in 2014, of the CUNY Advanced Science Research Center. It will be both a crowning achievement for public education and the opening of an even more ambitious era of science.

> *No great university can truly claim to be at the forefront of knowledge unless it takes seriously its involvement with science. Our core goal is to create an integrated network of talented scentists by building on the University's strengths and focusing on areas of great promise.*
>
> Chancellor Matthew Goldstein

The ASRC will bring to New York City an innovative research center that takes an unusually expansive and collaborative approach to the pursuit of world-class science with real-world impact. Led by top researchers in some of global science's most dynamic disciplines, the $350-million center — a striking 200,000-square-foot building adjacent to City College in Upper Manhattan — will position the nation's largest urban public university at the vanguard of 21st Century scientific exploration and education.

The ASRC is conceived to break down some of the traditional walls in science, incubating a culture of collaboration between researchers in five distinct but increasingly interconnected disciplines: Nanoscience, Photonics, Structural Biology, Neuroscience and Environmental Sciences. Each of these flagship initiatives builds on the strengths CUNY has developed over the past decade, and presents new research opportunities for faculty and students and partnerships with other institutions in the city and beyond.

As a University-wide enterprise, unprecedented in scope and concept, the ASRC will be a beacon of science in the public interest at a time when the public interest includes both pursuing discoveries that benefit society and inspiring the next generation of scientists, engineers and technicians. This is especially so at public universities, and CUNY is cognizant of that responsibility. Its guiding mission is to offer affordable, quality education to a student body of more than 250,000 that includes a large percentage of first-generation college students. Moreover, three quarters of its students remain in New York and enter the local job market after graduation. That gives CUNY a critical role in the city and state's economy — another key factor in its commitment to providing students with greater access to degree programs and opportunities for advancement in the STEM fields.

The ASRC will not only enable the emerging generation of CUNY faculty researchers to take their work to higher and more sophisticated levels. As the new flagship of CUNY's science initiatives, it will play a vital role in the University's greater mission to inspire students of all backgrounds and academic levels. And it is poised to become a major player in New York's growing research community, forging productive new relationships with the city's other prestigious institutions and reaching out to the public to help make New York a more scientifically literate city.

The ASRC will elevate CUNY's research in some of global science's most vital disciplines. With state-of-the-art facilities and a highly creative research culture, it will greatly enhance our ability to recruit and retain scientists with national reputations and attract top doctoral students from across the country.

Vice Chancellor for Research Gillian Small

Background

World-class science is part of CUNY's legacy — 10 graduates of CUNY colleges won Nobel Prizes in physics, chemistry and physiology or medicine between 1959 and 1988 — and in 2001 Chancellor Matthew Goldstein pledged a resurgence for the new century. To be a great modern university, he asserted, CUNY had to have great science. The Chancellor and Board of Trustees set in motion what became known as the "Decade of Science," a long-term commitment to attracting and retaining the best and brightest science faculty, building state-of-the-art facilities and competing with the nation's top institutions for government and foundation research dollars.

The ASRC is the culmination of a decade of ambitious strategic planning and investment, and a bridge between CUNY's history and its future. The concept of the CUNY Advanced Science Research Center was embraced in the **2008-2012 CUNY Master Plan,** which states:

"In keeping with CUNY's evolution into an increasingly integrated institution, construction on a CUNY-wide Advanced Science Research Center (ASRC) will begin in 2008. The ASRC will provide high-end instrumentation to support the work of many scientists from across the various CUNY campuses, and it will facilitate the development of integrated research collaborations." (More information from the 2008 and 2012 CUNY Master Plans related to the ASRC may be found in Appendix 1)

> *The thing that impresses me about the CUNY plan is that it's strategic. It's picked some very key core areas that are not just curiosity-driven research, which is what we often see. It's mission-oriented.*
>
> — Ellis Rubinstein, president and chief executive of the New York Academy of Sciences (The New York Times)

ASRC Mission

The mission of the ASRC is to be a catalyst for interdisciplinary scientific research and discovery and develop a university–wide integrated scientific research network. The center will build on CUNY's areas of strength, bringing together top researchers in those fields and providing them with a creative environment and the most advanced equipment available. ASRC scientists will form a distinctive research culture — one that is creative, collaborative and convergent — to spark innovative approaches to complex scientific challenges.

The center will raise CUNY's profile as a major American research university, helping it compete for research dollars and science talent ranging from prestigious faculty to talented post-doctoral fellows and graduate students. Recruiting and inspiring the next generation of scientists and entrepreneurs will extend to undergraduates and even to high school students through an active public outreach and education program.

The ASRC will support CUNY's long-term goal of nurturing faculty discoveries and bringing them to the marketplace, yielding practical benefits to the public, both scientific and economic. The ASRC will be a center dedicated to science in the public interest, a research building that opens its doors to the public. It will promote science understanding and education and be a visible link to the community.

Strategic goals of the ASRC

1. Investigate critical scientific/societal challenges

Five flagship areas will receive support through the recruitment of accomplished research faculty and the acquisition of high-end instrumentation that will be housed in the ASRC. These targeted key areas of science hold promise for real advances during the coming decades.

- **Nanoscience**

Nanoscience is science on the tiniest scale applied to sprawling effect. CUNY nanoscientists and technologists control matter at atomic or molecular scales of up to 100 billionths of a meter to create extraordinary new materials and devices that advance fields ranging from biomedicine to energy production. The ASRC's state-of-the-art facilities and instrumentation will enable its resident nanoscientists and their colleagues from CUNY campuses to develop breakthroughs in disease diagnosis, drug delivery and other advances in health care. Nanoscience's potential applications extend across the ASRC's other disciplines, from photonics to environmental sensing. Thus the nanoscience initiative has great potential to attract venture capital partnerships, allowing CUNY and its faculty researchers to bring their discoveries to the marketplace.

- **Photonics**

Photonics is the science of generating and using light and other forms of radiant energy for a broad range of applications. Earlier generations of photonics researchers developed some of the most pervasive technologies of modern life—fiber-optic communications, bar code scanners, DVD players—and now the field is laser-focused on making super-fast optical computers and developing biomedical diagnostic devices such as instruments that could make surgical biopsies virtually obsolete and help detect agents of bioterrorism. Photonics encompasses many areas of science: Biology, medicine, physics and technology fields such as computer display and lighting and the futuristic fields of quantum encryption and information processing. That breadth of expertise led CUNY to develop photonics as a University-wide strength over the past decade and made it a natural choice for the ASRC and its concept of collaboration across disciplines.

- **Structural Biology**

Researchers in this hybrid discipline of biology, chemistry, physics and engineering seek an atomic-level understanding of the architecture and functioning of biological molecules, enabling advances in human health, agriculture, energy, and materials science. CUNY has developed a national reputation for structural biology: It has 30 teams of researchers working on seven campuses—a virtual institute that will find a center of gravity in the ASRC—and is a partner in the internationally known New York Structural Biology Center, which is in walking distance of the ASRC. The initiative's goal is to become a cutting-edge crossroads for scientists making biomedically important discoveries.

- **Neuroscience**

A network of researchers in 55 labs make neuroscience another vast enterprise at CUNY and a natural choice as one of the ASRC's flagships. Researchers on CUNY campuses are working to map the brain's biochemical circuitry and find treatments for brain diseases ranging from Parkinson's to Alzheimer's, and for preventing or even reversing paralysis after spinal cord injury. They are studying the mechanisms of depression and the actions of drugs to treat it; addictive behaviors and drug abuse; the development of the nervous system and how we experience vital sensations such as vision and smell. CUNY researchers will find new partners and resources in the group of top neuroscientists who will be bringing their research to the ASRC.

- **Environmental Sciences**

The Environmental CrossRoads initiative focuses on strategic new approaches to environmental challenges—global, regional and local. Led by Charles J. Vörösmarty, an internationally recognized expert in global water issues, the initiative will promote collaborations between scientists, engineers and technologists, joining with policy experts, to craft innovative solutions to urgent and emerging environmental problems. Satellite data collected by state-of-the-art environmental sensing technologies in the ASRC's rooftop observatory will allow researchers to assess challenges from pollutants over the city to environmental changes across the planet. Dr. Vörösmarty sees technology as a transformative force for environmental stewardship whether it is protecting the marine ecosystem of coastal waters, predicting the risk of West Nile exposure, or monitoring for agents of bioterrorism.

2. Encourage interdisciplinary research and scholarship

The ASRC's five flagship initiatives were carefully selected, individually and collectively, for their interdisciplinary nature. The researchers who will populate the center—a director for each initiative and three levels of resident scientists—are being recruited with that collaborative spirit in mind. Each of the five flagship initiatives will occupy a floor of the ASRC but be linked to the others by design. With its flowing floor plans and wide-open central stairway, the building itself will promote intellectual cross-pollination and partnerships between labs—a literal vertical integration of big ideas. And researchers from every corner of the five initiatives will work side-by-side in the ASRC's core facilities, sharing equipment that will be among the most advanced of its kind.

ASRC seminars will feature talks like this one by Dr. Jerry Melillo, a top biological ecosystems expert who is a member of the center's Advisory Board.

Like the researchers already at CUNY who will become part of the ASRC, the new wave of faculty will be drawn by the opportunity to work in an innovative, entrepreneurial research environment. On the neuroscience floor, researchers will be mapping the brain's biochemical circuitry to solve unconnected puzzles, from Alzheimer's to spinal cord injury. The neuroscientists will join forces with their colleagues on the nanoscience floor who work with matter on a molecular scale to make the tiniest electronic circuits—thousands of times smaller than even microcircuits—that might lead to new medical treatments. The nanotech scientists will in turn find collaborations on the photonics floor, where researchers will be developing methods of using light to detect bioterror bacteria—or to diagnose cancer without a biopsy. And researchers throughout the center might find opportunities for partnership on the structural biology floor, where biologists, chemists, physicists and engineers will come together to push the frontiers of applied research in all the life sciences.

The ASRC's five directors will be a special breed: Scientists with national reputations for high-level research who are also science leaders with vision beyond their own disciplines. They will build teams within the ASRC and develop collaborations across CUNY—and beyond. The ASRC will seek out opportunities to form integrated research partnerships with peer institutions in New York and across the country.

3. Support student learning

The ASRC directors and resident scientists in the five strategic areas will have active research programs that will provide research opportunities for students at all stages in the STEM pipeline. Postdoctoral associates, graduate students, undergraduates, and in some cases, high school students will be able to gain hands-on research training and experience while working with ASRC scholars on specific projects in their labs.

In addition, as more campus-based CUNY faculty members take advantage of the ASRC core facilities, an ever expanding number of undergraduate and graduate students will be exposed to the practical application of state-of-the-art technologies, methodologies and practices in their chosen field.

CUNY's summer program for undergraduates gives students hands-on research experience.

The ASRC will become a focal point for many of the initiatives undertaken by CUNY in recent years to invigorate science education for students at all levels and generally promote interest in science among the city's young. These include:

Summer Undergraduate Research Program: A 10-week program that offers students a hands-on research experience, working with faculty mentors and members of their research teams.

CUNY Nobel Science Challenge: A competitive essay contest in which students convey the work of each year's Nobel Prize winners and are judged on how well they communicate the science in a way easily understood by the general public.

CUNY Design for Unicef Challenge: CUNY students offer creative solutions to improve child survival in developing countries

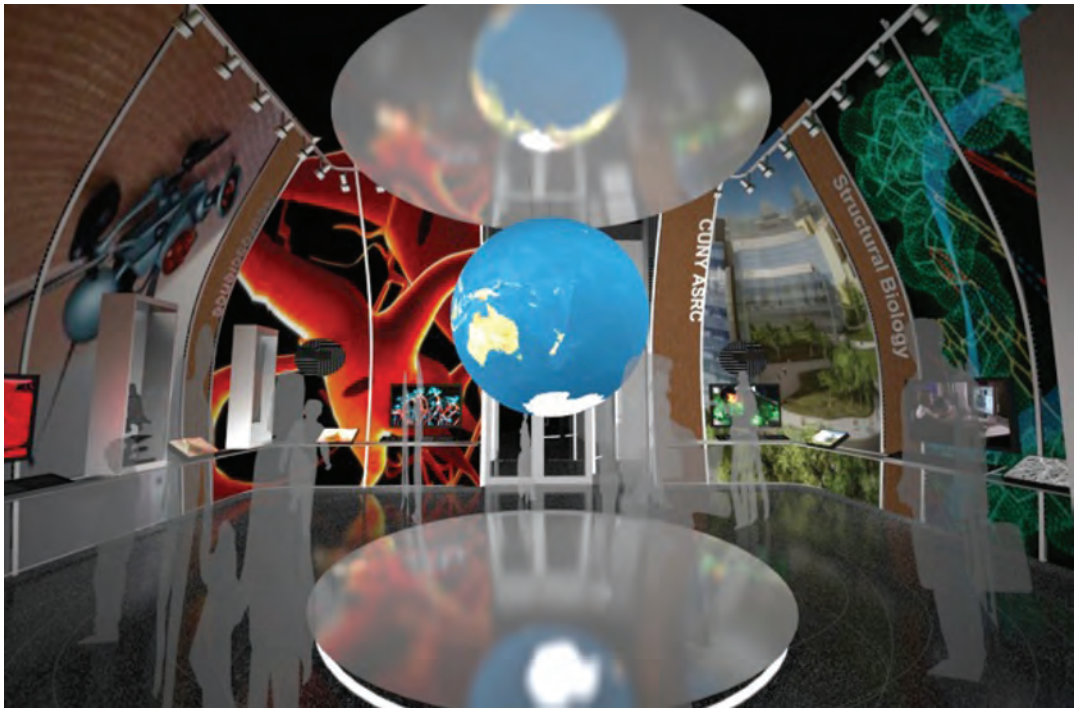
4. Promote community engagement and awareness

The ASRC will be a center dedicated to science in the public interest — and to interesting the public in science. It will be a rarity in the science world and an unusual entry in the life of New York: A working research building that opens its doors to the public to promote understanding of high-end science and inspire the next generation of scientists and entrepreneurs.

The ground floor will feature a Science Discovery and Education Center where middle and high school stu-

dents and the general public will have a hands-on introduction to the work being conducted on the floors above. Dazzling interactive media will showcase the five flagship initiatives. Among the features planned are real-time video and data feeds from ASRC facilities such as the cleanroom and the Environmental CrossRoads initiative's rooftop remote sensing platform.

The ASRC's seminar room and auditorium will host conferences, workshops and lectures on science and public policy issues related to science. They will feature ASRC scientists and other CUNY faculty, as well as distinguished researchers from outside the university. The ASRC will also be the home of a series of more informal science "cafes" open to the public where scientists lead conversations on topics in the news. These programs will be aimed at promoting science interest and literacy beyond the walls of academia, offering a chance for people who are not versed in the sciences to learn about complex topics in understandable language. One such program is **Women in Science** - a series of forums, workshops and other events designed to support women pursuing careers in STEM disciplines and provide CUNY's community of women scientists with networking and mentoring opportunities and practical tools for building their careers.



The Science Discovery and Education Center will be a an important introduction to visitors

5. Develop solutions to benefit the people of New York and the larger community

The ASRC will anchor an emerging research corridor in Upper Manhattan that includes several CUNY entities as well as peer institutions. They include the five-year-old CUNY Energy Institute, the new CUNY Hub for Innovation and Entrepreneurship and a new City College science building that will bookend the ASRC. A block away is the New York Structural Biology Center, a prestigious partnership of institutions that includes CUNY. And nearby will be Columbia University's new Jerome L. Greene Science Building, one of several institutions in the city with which the ASRC will seek opportunities for collaboration.

The ASRC will be at the gravitational center of CUNY's drive to become the kind of entrepreneurial university that public institutions must be to flourish in the modern world. One of the goals of the Decade of Science expansion has been to nurture the development and commercialization of faculty discoveries—intellectual property and inventions in emerging technologies that can lead to spinoff companies and partnerships with industry. This approach, long standard among private universities, aims to bring advances to the public, boost the regional economy and create new sources of revenue for CUNY in challenging economic times for public higher education.

Though New York City is traditionally known as a corporate, financial and media capital, its growing stake in technology, pharmaceuticals, energy and countless other industries of global relevance is a draw for cutting-edge researchers who will find in the ASRC a unique opportunity to re-imagine their labs and broaden their possibilities. Among other things, they will find exciting new opportunities for collaboration, both with CUNY colleagues and peers at other institutions. CUNY partners on research initiatives with Columbia University and New York University, and the ASRC will increase the opportunities for such collaborations with peer institutions in New York and beyond.

Critical to the long-term success of the ASRC will be the neighboring CUNY Hub for Innovation and Entrepreneurship. The Hub will be a business incubator, designed to offer researchers professional mentorships, as well as guidance in raising capital, securing lab space, developing staff and marketing their inventions. The Hub includes plans to establish a fund to attract support for companies that are originated, sponsored, or incubated by CUNY. The move to be more entrepreneurial received a boost from the recent National Science Foundation grant to CUNY's partnership with Columbia and NYU. It's part of a new national initiative to help academic researchers bring their discoveries to the marketplace.

Jobs requiring degrees or training in technology, science and engineering make up an important and growing sector of the New York employment market, and the ASRC is part of CUNY's commitment to encourage young people in New York to pursue STEM educations and to provide opportunities for sophisticated research experiences that will help them compete at higher levels. The ASRC will also be a catalyst for the receiving end of the pipeline, contributing to the expansion of the city's science and technology economy and creating more jobs for skilled graduates.

The ASRC will form part of a new science corridor across northern Manhattan

Operations

The first phase of the two-phase plan for the CUNY ASRC is a $350 million, 200,000-square-foot, five-story science center with flexible space for laboratories, meeting rooms and offices for approximately 80 professionals.

Each floor will be devoted to one of five strategically selected program areas, or initiatives: Nanoscience, Photonics, Structural Biology, Neuroscience, and Environmental Crossroads. Although each program area will contain unique skills and capabilities, the ASRC mission and its physical structure support the intention of creating a highly collaborative research environment—a vertical integration of the horizontal blend of many disciplines.

The ASRC will be overseen by an Executive Director. The founding Executive Director is Dr. Gillian Small, CUNY Vice Chancellor for Research and an established cell biologist. She is building an experienced yet streamlined organization with the goal of creating efficient operations and innovative ideas. A total of 20 new faculty researchers will be recruited, including a director for each of the five initiatives.

The directors are being recruited nationally and they in turn will recruit three faculty researchers as ASRC scientists. Each of the new faculty will also have a faculty appointment at one of CUNY's senior colleges, based on the best fit for their area of expertise. The directors will also facilitate the development of integrated research collaborations both within CUNY and between CUNY and peer institutions across New York State and the nation.

The ASRC will provide approximately $50 million worth of sophisticated equipment and staff support to researchers at the ASRC and from across CUNY. These resources will also be made available for a fee to external collaborators. High-end core facilities and instrumentation in the ASRC, never before available at CUNY, will allow scientists to expand the scope and scale of their research endeavors. The core facilities will include a Clean Room/Nanofabrication Center, Imaging facilities, Visualization Room, and a Rooftop Observatory.

The ASRC will also include a Science Discovery and Education Center that will serve as an important introduction to visitors to the ASRC. It will provide stunning, hands-on learning experiences for visitors ranging from students to distinguished guests. The Science Discovery and Education Center will help CUNY promote science education and awareness and be a visible link with the community.

Core Facilities: A Magnet for Top Scientists

The ASRC brings state-of-the-art equipment and instrumentation to CUNY, helping faculty from across the University expand the scope and scale of their work. As a large-scale centralized facility, it will also attract prominent scientists from other research institutions and from outside academia. The facilities include:

• CUNY's first cleanroom, a sealed laboratory in which the most sensitive diagnostics and nanofabrication can be conducted in an environment that controls the level of microbes and other airborne pollutants. The cleanroom will be among the most advanced in the New York area and contain equipment to both fabricate nanostructures and to study their physical, electrical, and optical properties.

• State-of-the-art imaging facilities including nuclear magnetic resonance spectrometry, functional magnetic resonance imaging, electron and fluorescent microscopes and other equipment supporting the research of structural biologists as well as neuroscientists.

• A Visualization Room with a wall of monitors in a small theater setting allowing researchers to see projections of their work in progress. Researchers will be able to generate graphic displays of predicted molecular structures such as proteins and biological molecular complexes, or intricate weather and environmental models in real time.

• Environmental Sensing Platforms on the top floor and the rooftop observatory will support research efforts in all aspects of remote sensing. The equipment will measure weather, atmospheric and solar data from satellites.

Development

The ASRC offers an opportunity for purposeful philanthropy—an investment in a transformational endeavor for the public good. New York State capital expenditures have paid for the center's construction and opening, creating opportunities for private philanthropic partnerships that will accelerate the center's research and elevate its reach.

The following have been identified as top strategic priorities:

- The ASRC's successful future demands the recruitment and retention of accomplished faculty. To this end, we seek to endow chairs for the directors of each flagship, as well as each junior faculty position. In addition, the ASRC must be in a position to provide recruitment packages that are competitive with their New York City peers. Support for these efforts will have long-term ramifications: Attracting top-tier scientists to direct the flagship initiatives will directly affect the science that is pursued, the faculty they in turn recruit and the opportunities provided students for years to come.

- It is imperative that the ASRC provide scientists with the most current and sophisticated equipment available to ensure their work continues to break ground. CUNY is investing about $50 million to open the center with the most advanced technology and equipment in the university's history—and some of the most specialized high-end facilities in the New York area. But maintaining and upgrading it will require significant ongoing investment. Keeping the ASRC's core facilities up to date will be crucial to our continuing efforts to recruit and retain top faculty and to forge strategic partnerships with other institutions.

- The ASRC will offer significant opportunities to introduce the larger community to the vital, fascinating and ever-advancing world of science. Through educational programming conducted at the Science Discovery and Education Center, the ASRC will strive to inspire young people to pursue careers in the sciences and to develop a more scientifically literate general population. We are looking for partners to help us do that.

The ASRC will provide unique opportunities for individuals to support specific scientific research and help nurture the emerging generation of scientific minds. It will help the nation's largest urban public university make quality education available to greater numbers of students — strengthening, in particular, the pipeline of graduates with science and technology degrees, ready to meet the challenges of the 21st Century economy.

The benefit to the city, the state, and the nation will be manifest and long-term.

Strategies for Achieving Strategic Goals

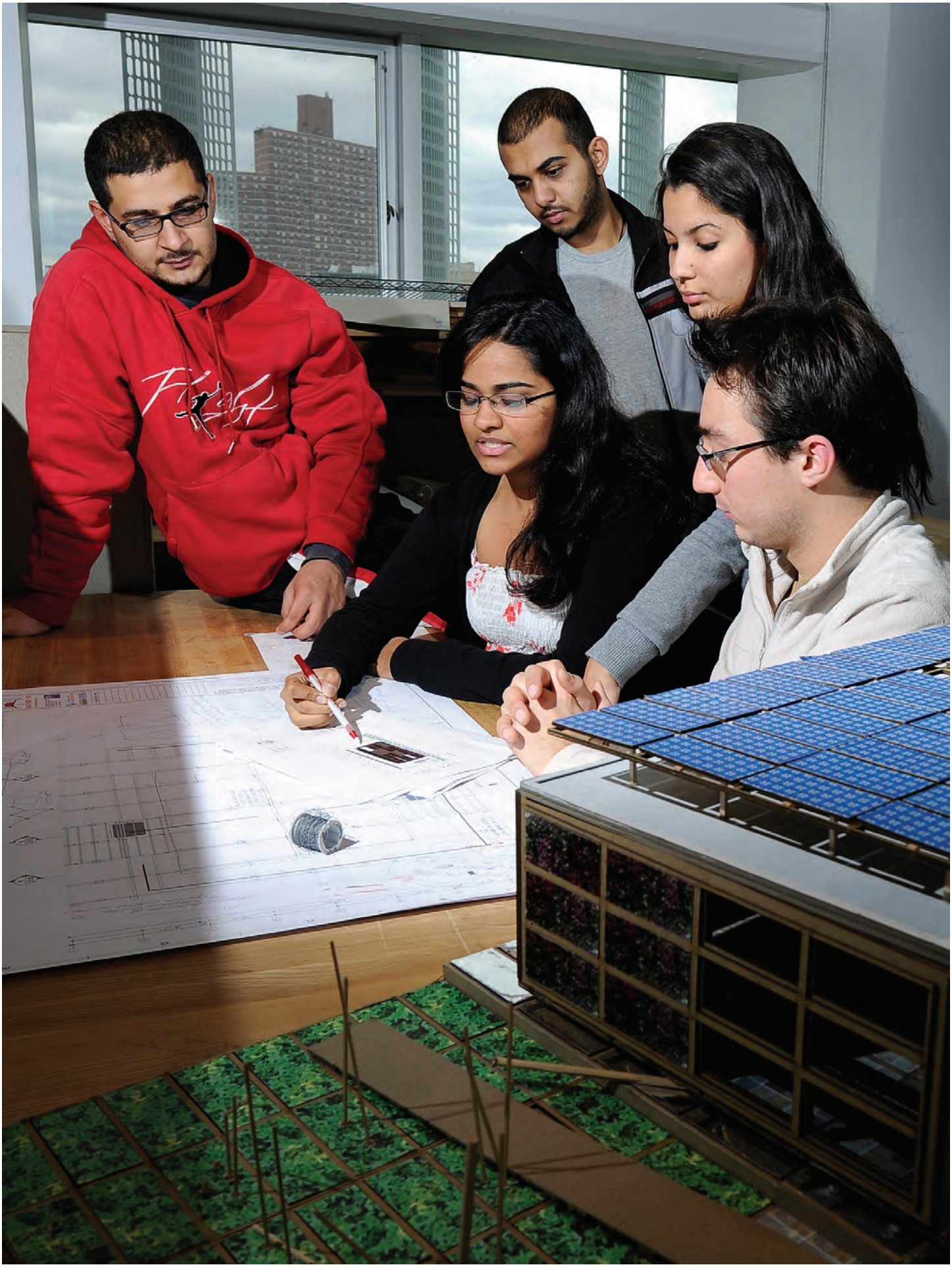
- Hire 5 distinguished faculty as directors in each of the key research areas
- Provide CUNY scientists with high-end instrumentation to support their work and preclude need to travel to other institutions in the Metro NY area or beyond
- Add world-class, research active, grant funded faculty in STEM fields
- Seed collaborative research projects wthin and across the five research areas
- Support CUNY efforts to ignite interest in the STEM disciplines through
  - programs in the Science Discovery and Education Center
  - opportunities for CUNY undergraduates, graduate students and postdocs to participate in research projects
- Host distinguished scientists to give seminars enriching the experience of CUNY faculty and students

Expected Outcomes

- Increase external grants and contracts to the University
- Integrate research collaborations both within CUNY and between CUNY and peer institutions in New York and nationally
- Compete successfully for large collaborative grants
- Retain research scientists of national prominence
- Improve recruitment of top level doctoral students and postdocs in the sciences
- Position CUNY as an equal research partner with other prestigious institutions in New York
- Expand CUNY's capacity to commercialize its intellectual property
- Fortify ties with industry
- Increase entrepreneurial activity
- Become a destination for creative and interesting programming that will build public interest in science and promote community engagement with science and CUNY
- Create new opportunities at CUNY for private philanthropic investments in a transformational endeavor for the public good
- Elevate CUNY's profile as a breeding ground of great science and scholarship
- Attract non-CUNY users of Core Facilities on a user-fee basis
- Garner positive media coverage of CUNY's new place in the research arena

The ASRC will be a center where science leaders with national reputations conduct their own high-level research while forging creative collaborations across the center's other disciplines.

— Vice Chancellor for Research Gillian Small



Appendix 1

Excerpts from the CUNY Master Plans

2008-2012

"The Decade of Science initiative will continue to draw CUNY's attention, resources, and energies over the next several years. Major programmatic elements include:
• Building a world-class, research-active, grant-funded faculty in the areas of science, technology, engineering, and mathematics (STEM);
• Constructing and refurbishing the University's science facilities, both on individual campuses and in the form of the new CUNY-wide Advanced Science Research Center (ASRC);
• Enhancing the research environment to take advantage of infrastructure improvements;
• Investing in graduate student support to attract the best-qualified doctoral students; and
• Training the next generation of mathematics and science teachers to serve in New York City's public school classrooms, through the University's Teacher Academy and other collaborative programs spanning the campuses."

"A top-flight faculty requires state-of-the-art facilities. Over the next decade, the University will expend more than $1 billion across its campuses in order to construct and modernize science facilities. In keeping with CUNY's evolution into an increasingly integrated institution, construction on a CUNY-wide Advanced Science Research Center (ASRC) will begin in 2008. The ASRC will provide high-end instrumentation to support the work of many scientists from across the various CUNY campuses, and it will facilitate the development of integrated research collaborations."

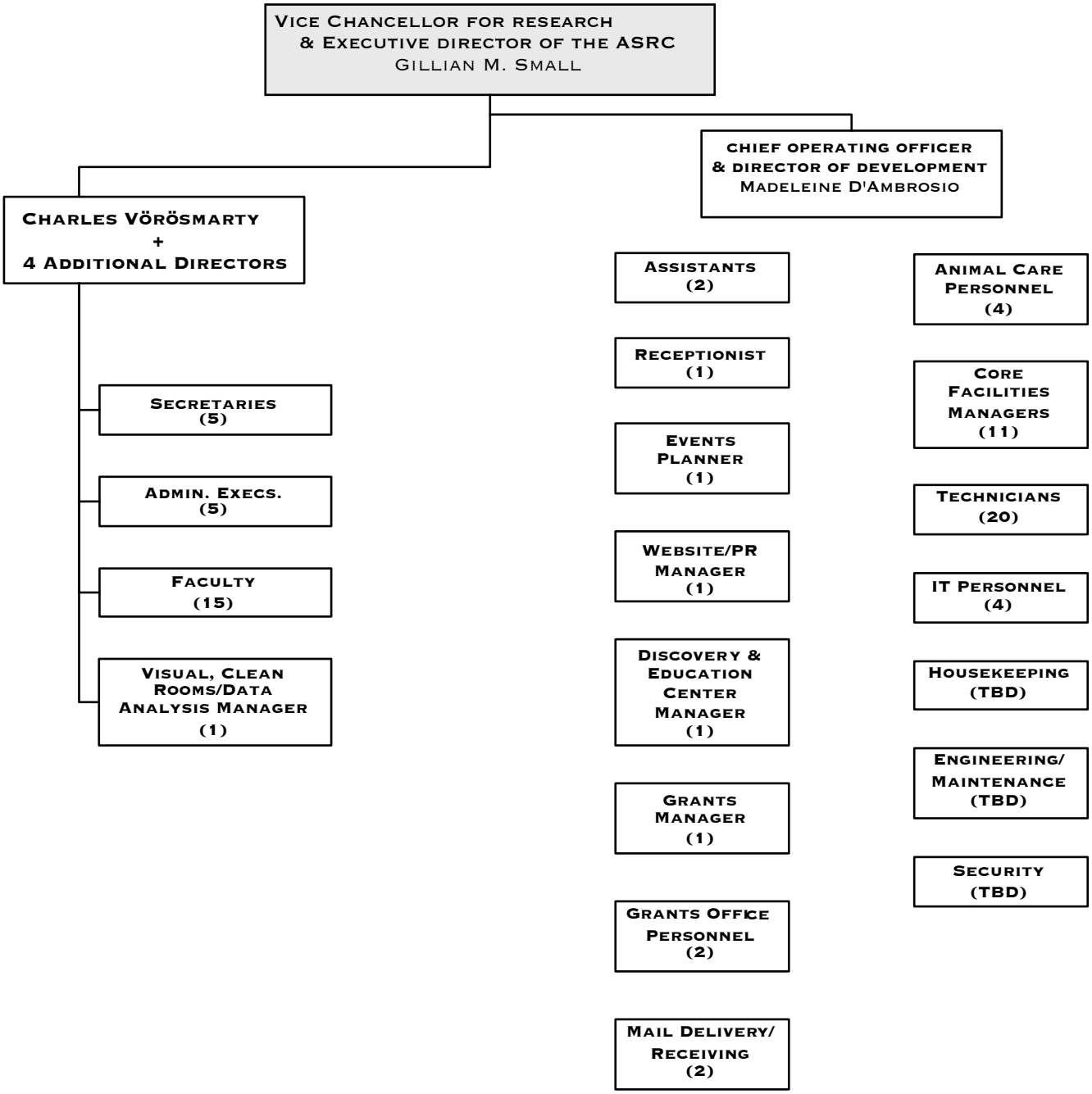
2012-2016

"Perhaps the most visible manifestations of the University's investment in the Decade of Science are the construction of new science facilities and the renovations of existing ones on eight campuses. Central to this effort has been the planning and construction of the CUNY Advanced Science Research Center (ASRC), a shared facility that will foster the development of a University-wide integrated research network.

"The Advanced Science Research Center will be operational in 2014, and plans for staffing and outfitting the ASRC are accelerating. During the next few years, the University will recruit and hire distinguished faculty who will serve as directors in each of the key research areas: photonics, nanoscience, structural biology, neuroscience, and environmental science. A small cadre of additional research faculty will be recruited and housed at the ASRC. In addition, core facilities directors, technicians, and dedicated administrative staff will help operate the equipment and conduct the operations of the center. High-end core facilities and instrumentation will allow scientists from across CUNY to expand the scope and scale of their research. The ASRC will also facilitate the development of integrated research collaborations both within CUNY and between CUNY and peer institutions across New York State, and nationally."

Appendix 2

STAFFING



Appendix 3

OPERATING GUIDELINES

(Updated May, 2012)

The CUNY Advanced Science Research Center ("ASRC"), located on the South Campus of City College, will be a unique University-wide institution established to house and facilitate high-end research by CUNY faculty in five key and emerging scientific disciplines: photonics, nanotechnology, water and environmental sensing, structural biology and neuroscience. The sophisticated core facilities and instrumentation in the ASRC will allow scientists from across the University to expand the scope and scale of their research endeavors. The ASRC will also facilitate the development of integrated research collaborations both within CUNY and between CUNY and peer institutions.

The ASRC will be staffed by approximately 75 professionals, including approximately 20 faculty members affiliated with a CUNY college but whose grants will run through the ASRC, thereby helping to fund its operations. A senior research scientist will serve as Program Director for each of the five disciplines.

The operations of the ASRC will be supervised by the Vice Chancellor for Research who will also act as the Executive Director. There will also be a chief operating officer of the facility who will also be its chief fundraiser and will report to the Vice Chancellor for Research.

There will also be an ASRC Advisory Committee, which will consist of at least nine (9) faculty members, including the Executive Officers of the doctoral programs in physics, chemistry, biology and biochemistry and no more than four (4) administrators (including the Vice Chancellor for Research) appointed by the Chancellor. The President of the University Faculty Senate may designate two (2) faculty members of the Advisory Committee. All faculty members of the ASRC Advisory Committee shall be active researchers with a record of external funding in or closely related to the scientific disciplines that are the focus of the ASRC's research activities. They shall all serve for renewable one-year terms. The Vice Chancellor for Research shall serve as Chairperson of the Advisory Committee, which shall meet at least once per semester.

The Advisory Committee may make recommendations to the Vice Chancellor for Research on any matter relating to the operation of the ASRC, including the appointment of the Program Directors, the selection of equipment to be purchased, the allocation of offices and other resources to faculty members within CUNY, the establishment of a fee schedule for the use of equipment, the preparation of an annual budget, the planning for the second building (ASRC II), and additions or modifications to the five scientific disciplines that will be the focus of the ASRC's research activities. The Vice Chancellor for Research will also select members of the Advisory Committee to serve on search committee s for the Executive Director, Program Directors, laboratory technicians and such other staff as the Vice Chancellor deems appropriate in accordance with University personnel practices and procedures.

Appendix 4

ASRC Internal Advisory Committee

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Appendix 5

ASRC External Advisory Board

David Cowburn, Ph.D.
Professor, Department of Biochemistry; Professor, Department of Physiology and Biophysics
Albert Einstein College of Medicine

Charles Marcus, Ph.D.
Villum Kann Rasmussen Professor of the Niels Bohr Institute
University of Copenhagen

Roberto Merlin, Ph.D.
Peter A. Franken Collegiate Professor of Physics; Professor of EECS
University of Michigan

Jerry Michael Melillo, Ph.D.
Distinguished Scientist
Marine Biological Laboratory Ecosystems Center, Woods Hole

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