

# **Doctor of Philosophy in Color Science**

**EXTERNAL  
LETTERS OF SUPPORT**

**May 2006**

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June 22, 2004

Roy S. Berns  
R.S. Hunter Professor in Color Science, Appearance, and Technology  
Coordinator, MS in Color Science  
Rochester Institute of Technology  
Rochester, NY 14623

Dear Roy,

It is my pleasure to provide a note of support for the Ph.D. Degree Program in Color Science. I have been affiliated with the RIT Center for Imaging Science for 16 years. I was an adjunct faculty member from 1989-1992, and have been honored to serve on the CIS Advisory board for the past four years. Over this time I have become very familiar with the various programs within the Center for Imaging Science, including the activities of the Munsell Color Science Laboratory.

Xerox has benefited greatly from the Color Science education and research at the Munsell Color Science Laboratory. We have hired graduates, funded research directly and through the New York State Center for Electronic Imaging Systems, and consulted with the faculty and staff on numerous topics. The faculty, staff, and students associated with the Munsell Color Science Laboratory are recognized around the world, in both industry and academia as being first class.

It is especially exciting for me to see the desire to further the field of Color Science; those studies pertaining to the quantitative description of color. The world is full of visual imagery and materials, and color plays a very important part of the human experience. There is a definite need to keep pushing our understanding of how people perceive, react to, and control color in all the many ways possible today and coming for the future.

I look forward to continuing the interactions between Xerox, and the activities of the Munsell Color Science Laboratory. The addition of a new Ph.D. Degree Program in Color Science will be of benefit to Xerox, to Rochester Institute of Technology, to New York State, and to other industries and academic institutions around the world.

Sincerely yours,



Dr. Rob Rolleston  
Imaging Science and Systems Competency Lab Manager  
Xerox Research and Technology

Xerox Corporation  
Joseph C. Wilson Center for Technology  
Webster, NY 14580  
Telephone 585-422-0712  
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Worldwide Partner



June 24, 2004

Dr. Roy S. Berns  
Munsell Color Science Laboratory  
Rochester Institute of Technology  
Rochester, NY 14623

Dear Dr. Berns,

I recently learned of the proposal that is being considered to expand the Color Science M.S. program at RIT to offer the opportunity for students to obtain a Ph.D. in this field. I am writing this letter to affirm my support for this proposal. Color Science is an important field that plays a key role in many of the products and technologies developed here at Kodak, as well as throughout the imaging industry. Kodak has developed a strong collaborative relationship with the Munsell Color Science laboratory, and I believe that this step would only enhance the value of future collaborations.

I personally work with a number of individuals who have gone through the Color Science program at RIT, and they have demonstrated an ability to make important contributions here at Kodak. I suspect that several of them would have been very interested in the opportunity to extend their education in this area, and I am confident that the experience gained in obtaining a Ph.D. in Color Science would be highly valued by companies such as Kodak.

I look forward to hearing of the acceptance of this proposal, and to seeing the first group of students begin their studies in the near future.

Sincerely,

A handwritten signature in black ink, which appears to read 'Kevin E. Spaulding'. The signature is written in a cursive, flowing style.

Dr. Kevin E. Spaulding

Senior Principal Scientist  
Imaging Research and Advanced Development  
Eastman Kodak Company  
1700 Dewey Ave.  
Rochester, NY 14650-1816



One Microsoft Way  
Redmond, WA 98052

Michael Stokes  
[mistokes@microsoft.com](mailto:mistokes@microsoft.com)  
208-412-7751

July 6, 2004

Dr. Roy S. Berns  
R. S. Hunter Professor in Color Science, Appearance, and Technology  
Coordinator, MS in Color Science

Dear Roy:

Thank you for your kind and informative letter and documents describing the Ph.D. in Color Science proposal.

While it is true I had a unique and unpleasant experience in the previous doctoral process at RIT, my experience in the M.S. Color Science program has proven invaluable. After leaving RIT I was fortunate enough to experience opportunities to develop industry color management standards such as ColorSync, the ICC profile, sRGB (IEC 61966-2-1), scRGB (IEC 61966-2-2), color support in PNG and others. Recently I have been designing significantly new and novel color management architecture for Microsoft's future version of Windows, code named Longhorn. Much of the basic color science is based upon my experiences at RIT. It is my belief that I would not have been able to take full advantage of these opportunities if I had not completed the M.S. Color Science program at RIT.

I am honored to take this opportunity to express my support as well as that of my management for your proposal. We think this is a critical and opportune time for such a program to be established. We are seeing innovations in color devices and technologies at a pace unimagined even two years ago. The innovations in display technology alone are staggering, especially considering how long CRT technology dominated that field. These new devices and technologies increase the capabilities on what is possible, which in turn requires more advances in research as well as stronger candidates in industry. Therefore, we think a Ph.D. in Color Science will be of great service to the industry for many years to come.

Personally, this is such a compelling and interesting proposal that I am seriously considering participating if your proposal is approved.

Sincerely,

Michael Stokes  
Color Architect  
Microsoft Corporation

July 5th, 2004

Roy S. Berns  
Munsell Color Science Laboratory  
Rochester Institute of Technology  
54 Lomb Memorial Drive  
Rochester, NY, 14623

Dear Roy,

I am writing to express my strong and enthusiastic support for the establishment of a Ph.D. program in Color Science at the Rochester Institute of Technology.

Color Science is a keystone to the multi-billion dollar imaging industry. It is a core competency of large companies like Kodak, Xerox, Hewlett-Packard and Fujifilm and increasingly visible to the general public as a product quality differentiator. Surprisingly, the professional and academic communities are relatively small for such a large economic impact. Professionals in this area have traditionally gained their expertise through a mixture of hands-on experience and academic courses offered under related disciplines such as the arts, optics, physics and engineering, but the increasing complexity and economic impact of Color Science has created high demand for specialization in this area. As the foremost research and academic group in Color Science, the Munsell Color Science Laboratory has increasingly been the source of the leadership and talent fueling this discipline over the last 15 years. The expansion of the program into a Ph.D. curriculum will be a unique opportunity for the many students and professionals looking for advance studies in this area.

RIT has several unique and strong assets that collaborated to establish its position of leadership. Some of those are the proximity to some of the world's largest industrial base in color science and imaging, a vast professional community committed to the advance and teaching of color science and imaging, a tradition of collaboration with industry and academia, a well placed body of alumni, and a distinguished set of researchers and professors. The evolution of the current Color Science curriculum into a Ph.D. program is a natural progression that reflects well the growth of MCSL and its increasing impact.

Please accept my support for this important program, and do not hesitate to contact me with further inquiries.

With best regards,



Ricardo J. Motta  
Vice President and Chief Technical Officer  
Pixim Inc  
Email : ricardo@pixim.com  
Phone : 650-605-1110



# The University of Chicago

Joel Pokorny, Ph.D.  
*Professor of Ophthalmology & Visual Science*  
*Professor of Psychology*

Vivianne C. Smith, Ph.D.  
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June 25, 2004

Roy S. Berns  
R. S. Hunter Professor in Color Science, Appearance, and Technology  
Munsell Color Science Laboratory  
Rochester Institute of Technology  
54 Lomb Memorial Drive  
Rochester, New York 14623-5604

Dear Roy,

I have read through the proposal for an RIT Ph.D. Degree Program in Color Science and find it exciting. The proposed program is unique. Color science encompasses a diversity of academic disciplines. The graduates will have comprehensive training in color science and research techniques and will be competitive for high-quality academic or industrial positions. I am not aware of a comparable Ph.D. program.

The Ph.D. program will be overseen by an experienced academic faculty with active research programs and strong international reputations. Graduate students will be exposed to a broad range of practical and theoretical color topics. Examples: the current faculty has research interests spanning medical data visualization, computer graphics, art conservation, spectral and spatial measurements of materials, color printing, digital photography, and modeling of perceptions for use in defining color quality. The curriculum is designed to provide a core body of knowledge and skills that may be applied to current and future applications.

The RIT M.S. degree program in Color Science has proved an outstanding success. I know a number of graduates, and am impressed with the quality of education they have received. Graduates with M.S. degrees are equipped to apply the knowledge they have gained but in general their training does not facilitate novel applications or original research. The doctoral research experience gives the graduate tools to apply color technology to new problems and to perform basic research related to the physiological

mechanisms subserving human color vision.

As a member of the Munsell Color Science Laboratory Advisory Board, I have followed closely the activities of the RIT faculty and the students involved in the program. The initiation of a Ph.D. program is a positive step at this time; an excellent faculty proposes to provide advanced graduate training in an area that has broad industrial and basic science application. I heartily endorse the proposal.

Yours sincerely,

A handwritten signature in black ink, appearing to read "James T. Palmer". The signature is written in a cursive style with a large, prominent initial "J".



June 22, 2004

Professor Roy S. Berns

R. S. Hunter Professor in Color Science, Appearance, and Technology  
Coordinator, MS in Color Science

Dear Professor Roy S. Berns

Thank you very much for your good news and information.

It is with a great pleasure for me and Japanese color scientists and Engineers to organize Ph.D. course of color science in RIT.

Professors Roy S Berns , Mark Fairchild and other staffs in Munsell Color Science Laboratory, Center for Imaging Science of RIT give their leadership, contribution and most importantly for color science and technologies. They also contribute to the education of a new generation of leaders in color science in the world. For example, many Japanese scientists and engineers belong to SONY, TOPPON PRINTING, KONICA-MINOLTA, CANON, MATSUSHITA ELECTRONIC, FUJIPHOTOFILM, SEIKO EPSON etc. which are leading companies of imaging in the world have been studying at MCSL for a long time.

I believe that a new program of Ph.D. in color science will give a great contribution and role for color science research and education in the world.

I hope that we'll have exchange program for Ph.D. course students studying color science between RIT and Chiba University in the near future.

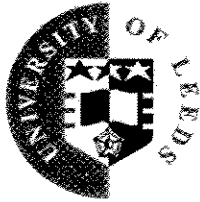
Sincerely yours

A handwritten signature in black ink, appearing to read 'Yoichi Miyake'. The signature is fluid and cursive, with a long horizontal stroke at the end.

Yoichi MIYAKE

Professor and Director, Research Center for Frontier Medical Engineering  
Professor of Department of Information and Image Sciences, Chiba University





Professor Roy Berns  
Munsell Color Science Laboratory  
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5th July, 2004

Dear Sir,

As Professor of Colour and Imaging Science at the University of Leeds and former Director of the Colour & Imaging Institute at the University of Derby, it has been a great honour to be an advisory member of the Munsell Color Science Laboratory (MCSL). I am writing to support its new PhD programme in colour science.

Colour science is a multi-disciplinary subject including physics, chemistry, psychology, mathematics and statistics. It is also widely applied throughout many businesses, ranging from the surface colour industries such as textiles, coatings, plastics and automobile to the imaging industry. Over the years, I have successfully supervised 14 PhD students in the field of colour science, of which 8 of them are now working in industry while the others are academics in universities or government research organisations. The latter case is due to many of them receiving government or university funding in order to study abroad; hence they had to stay within academia upon their return. The demand from industry to recruit high quality colour scientists, however, has been non-stop. It is also more rewarding to supervise PhD students than MSc students because the former are more experience and knowledgeable in a particular research field and are able to produce much higher quality research results.

The new programme is an extension of the existing MSc programme in colour science which should mean that the existing infrastructure and research environment should comfortably cope with the increased number of PhD students. With the very strong package of teaching and research at MCSL, I fully expect that there will be many breakthroughs in the colour research and application areas. I am particularly impressed by some of the targeted research areas in the proposed programme such as conservation science, spectral-based archiving of culture heritage, spectral-based computer graphics, data visualisation, colour appearance models and novel metrics of colour quality. These areas have large commercial potential and include many academic research components. I also envisage that there will be a production stream of top scientists and leaders of the next generation.

I strongly support the PhD programme in colour science at MCSL and look forward to closer collaboration between the postgraduate schools at MCSL and Leeds University.

Yours faithfully,

A handwritten signature in black ink, appearing to read 'M. R. Luo'.

**M. Ronnier Luo**

Professor of colour and imaging science  
Advisory member of Munsell Color Science Laboratory

# The Museum of Modern Art

July 5, 2004

James Coddington  
Agnes Gund Chief Conservator

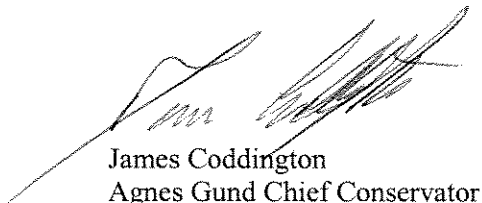
Dr. Roy Berns  
R.S. Hunter Professor in Color Science  
Munsell Color Science Laboratory  
54 Lomb Memorial Drive  
Rochester Institute of Technology  
Rochester, NY 14623

Dear Roy,

I am writing to let you know of my enthusiastic support for RIT's proposed Ph.D. program in Color Science. In recent years the application of color science and digital imaging has increased dramatically in the area of cultural heritage preservation. The proposal's clear emphasis on this facet of color science promises to provide significant and lasting contributions to cultural heritage preservation.

The accurate recording and documentation of our cultural artifacts is at the very core of the systematic care and preservation of cultural artifacts. RIT's involvement with cultural institutions, including MoMA, has shown in very concrete ways how color science can enhance this critical activity. The proposed Ph.D. program's vision goes well beyond this for it will introduce, for the first time, doctoral level research to new applications of color science and imaging technology to museums, archives, libraries and other institutions charged with preserving art and artifacts of all kinds. The results of this research will offer us new ways to understand the objects in our collections and new ways to present this to our public. Ultimately I expect color science and color scientists to be an integral part of the practice of conservation. RIT's Ph.D. program recognizes all of this and thus will take a true leadership position in both color science and cultural heritage. I am extremely pleased to be offer these words of support for this program and indeed hope to work with the program and its graduates in the coming years.

Sincerely,



James Coddington  
Agnes Gund Chief Conservator



National Research Council  
Canada

Conseil national de recherches  
Canada

Institute for National  
Measurement Standards

Institut des étalons  
nationaux de mesure

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Ottawa, Canada  
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1200, Chemin de Montréal, M-36  
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5 July 2004

Dr. Roy S. Berns  
R. S. Hunter Professor in Color Science, Appearance, and Technology  
Munsell Color Science Laboratory  
Center for Imaging Science  
Rochester Institute of Technology  
One Lomb Memorial Drive, P.O. Box 9887  
Rochester NY 14623-0887  
USA

Dear Roy:

As a Past President of the International Colour Association (AIC) and a Past Vice President of the International Commission on Illumination (CIE) I was very pleased to hear of your proposal to expand the Color Science MS program at RIT to include a Ph.D. This will fill a very important gap as, to my knowledge, there is no other Ph.D. program in color science in North America. Graduates of the program will provide a much needed pool of talent at the highest scientific level for a variety of industries and for academia. Although color science is a vital component of many industries, the normal practice has had to be to hire graduates with other specialties and to train them in color science on the job. The existence of a Ph.D. program at a well established school with an existing reputation in the field will enable this practice to change. The Munsell Color Science Laboratory has a top class faculty and I know that you are well capable of producing excellent Ph.D. graduates to add to the MS graduates that you already produce.

As you know, I have worked here at the National Research Council of Canada for 38 years and I can say with some certainty that the pool of talent from which we have hired new employees for our color work would have been much richer if such a program had existed in the past.

I support your proposal without hesitation and I look forward to hearing of its success.

Yours sincerely,

Alan R. Robertson  
Strategic Advisor to the Director General

**From:** Jack Hsia <jack.hsia@nist.gov>  
**Subject:** **Ph.D. in Color Science -- letter of support**  
**Date:** June 30, 2004 2:20:11 PM EDT  
**To:** Roy Berns <berns@cis.rit.edu>

June 30, 2004

Roy S. Berns  
R.S. Hunter Professor in Color Science, Appearance, and Technology  
Coordinator, MS in Color Science  
Rochester Institute of Technology

Dear Prof. Berns:

It is with great pleasure and enthusiasm that I write to support the establishment of a doctoral degree program in Color Science in the Rochester Institute of Technology (RIT).

My technical expertise has been in the development of measurement methodology in spectrophometry and colorimetry. I have also been active in national and international committee work relating to color and illumination. From 1995 to 1999, I served as President of the International Commission on Illumination. This Commission has been recognized worldwide as the premier international standardizing body on fundamental aspects of metrology evaluation and application of light and color.

Even though color science is a mature science, there are still many issues in the fields of color perception, color rendering index, and color appearance, among others that require in-depth research. Additional findings in the color field and significant research results are necessary to lay a solid foundation upon which the national and international standard organizations can set important documentary standards. These findings and deeper understanding will prove to be highly beneficial to the general users, industries, and other research institutes.

In short, I strongly support RIT's plan to establish a doctoral program in color science.

Sincerely yours,

Jack J. Hsia, Ph.D.

Contact information:  
National Institute of Standards and Technology  
100 Bureau Drive, Mail Stop 1090  
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## DuPont Herberts Automotive Systems

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June 28, 2004

Prof. Roy S. Berns  
Rochester Institute of Technology

### **Ph. D. Degree Program in Color Science**

It is my pleasure to comment on the proposed doctoral program in color science at Rochester Institute of Technology as part of the review process with RIT and the New York Department of Higher Education. I'll briefly state my experience that applies to graduate color science education and discuss demand and preparation for research careers in color science.

I hold a Ph. D. in Analytical Chemistry from Rensselaer Polytechnic Institute with specialization in color science. From the 1960's to the 1980's RPI had a large and active Ph. D. program in color science within the chemistry department that produced about 30 Ph. D. students who are now in responsible academic and industrial positions. My color science career includes work experience in government (National Research Council of Canada) and industrial (DuPont Performance Coatings) color research and part-time experience in undergraduate and industrial out-reach teaching (Eastern Michigan University). I am a member of the Munsell Color Science Laboratory advisory group and have sponsored cooperative research with MCSL and thus have had an opportunity to observe the color science program at RIT.

There is a sustained demand for color scientists in industry to staff applied research positions in information technology and materials technology industries. For example, DuPont Performance Coatings maintains a color research program to develop color products, processes and services for a global automotive coatings business. In our coatings business alone, we currently employ six Ph. D. level color scientists in addition to BS and MS level personnel. Recruitment for these advanced research positions is difficult due to the lack of a reliable supply of candidates with advanced color science preparation. The background we are looking for is an undergraduate preparation in science or engineering and graduate research experience in color science. It is nearly impossible to find such candidates (in my 27 years at DuPont I am the only Ph. D. with academic preparation in color science). We currently staff these positions by on-the-job development of scientists with backgrounds in chemistry, physics, engineering or computer science. On-the-job development is an inefficient process since it takes years to develop expertise and determine whether the scientist has a long-term career interest in color science. We would be delighted to hire Ph. D. color scientists that have the appropriate preparation and a career interest in color science.

I am most enthusiastic that the proposed Ph. D. color science program provides the concentration of resources required to provide a focused program in color science. Advanced degree programs in color science at other universities have usually been aligned with a single professor within a

chemistry or textile chemistry department. Such programs do not have the teaching and research resources to support full time education in color science. In these other programs students must qualify in chemistry and will take most of their course work in areas other than color science. Color is an interdisciplinary field that draws students with science, engineering, psychology and applied technology backgrounds. In contrast the RIT proposal has the resources to provide a focused Ph. D. education in color science. The proposed outline of coursework and research experience is well targeted to the skills needed for an industrial career in applied color research. Students can come into the program from a variety of technical undergraduate backgrounds and with supplemental preparation from non-technical backgrounds. This makes an advanced education in color science available to students with diverse undergraduate preparation that is appropriate for a multi-disciplinary science.

In conclusion, I believe the proposed program will provide an excellent doctoral education for students seeking careers in color science.

A handwritten signature in black ink, appearing to read "David H. Alman". The signature is fluid and cursive, with a long horizontal stroke at the end.

David H. Alman  
Senior Research Fellow

July 1, 2004

Prof. Roy Berns  
Munsell Color Science Laboratory  
Rochester Institute of Technology  
Rochester, NY

Re: Proposed Ph. D. Degree Program in Color Science

My comments on the proposed Ph. D. program in Color Science are from the perspective of an RIT alumnus, former adjunct CIS faculty, and consultant in the fields of imaging and color science.

It is exciting to finally see the extension of the RIT MS Color Science program to the Ph. D. level. Color has always been integral to our everyday life, particularly as a major component of our visual experience. The array of color science applications has increased tremendously in the past decade, particularly in the area of imaging and displays. From a consultants viewpoint, I continually see a paucity of adequately trained people in the area of color science. To me, it is no surprise that 100% of the MS students find immediate employment. RIT has performed remarkably to fill that gap, but more needs to be done.

In spite of the success of the MS Color Science program, there has been a virtual vacuum in terms of the education of future leaders in Color Science. Both at the academic level and the industrial research and development level, the lack of Ph. D. trained personnel has been apparent to me and many of my clients and colleagues.

Color Science is inherently multidisciplined. It is neither a physical science nor a psychological science, but lies in the intersection of these two diverse areas. Multidiscipline programs have a long, and successful, tradition at RIT. The proposed program combines an appropriate multidiscipline mix of course work and faculty, and builds on the highly successful MS Color Science Program.

From many perspectives I offer my total supports and encouragement for this undertaking. Given the foundation that has been in the MS Color Science program, this Ph. D. Color Science will be a great opportunity for RIT to provide the future leaders in Color Science.

Sincerely,

Peter G. Engeldrum  
President

\*\*\*\*\*

Peter G. Engeldrum  
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July 2, 2004

Roy S. Berns  
R.S. Hunter Professor in Color Science, Appearance, and Technology  
Munsell Color Science Laboratory  
Rochester Institute of Technology

Subject: Proposed Ph.D. in Color Science and MS in Color Science

Dear Roy,

I am glad to hear that you are advocating a Ph.D. and MS program in color Science. I fully support these proposals and am confident that having such a program focused on color science alone will enhance the credibility of the Munsell Color Science Laboratory. It certainly will advance the ability of the laboratory to focus on color issues without the necessity of having an imaging component. Such a program should be attractive to a large range of students. I think this program will be especially attractive in that it offer the options for both Ph.D and MS degree. Graduates will find a wide range of career opportunities.

As an industry advisory member of the Munsell Color Science Laboratory, I can confirm there is a need for color science graduates in industry. At 3M Company, trained scientists focusing on color issues - especially color appearance, color formulation and color quality control remain important ingredients in the development and marketing of the products we manufacture. Having participated in both the product development and the standardization of color measurement methods, I recognize that the training that this proposed program offers can help provide the people who can solve industrial color problems.

I hope that the proposed program is granted and wish for the continuing success of the Munsell Color Science Laboratory.

A handwritten signature in cursive script, reading 'Norbert L. Johnson', is located below the typed name.

Norbert L. Johnson  
Division Scientist  
Traffic Safety Systems Division  
3M Company  
St. Paul, MN 55144-1000





44 ALL ANGELS HILL ROAD, WAPPINGERS FALLS, NY 12590 PHONE AND FAX 845 297-7986 [c.mccamy@att.net](mailto:c.mccamy@att.net)

June 29, 2004

Roy S. Berns, Ph. D.  
Munsell Color Science Laboratory  
Center for Imaging Science  
Rochester Institute of Technology  
54 Lomb Memorial Drive  
Rochester NY 14623

Dear Dr. Berns,

In a doctoral program, I would expect you to provide candidates the opportunity to learn the facts of color science, understand the basic principles of color science and associated natural sciences and mathematics, and have some working experience in theoretical and applied color science. Those expectations are based on the fact that you are the recognized authority on higher education in this field, you have an excellent track record, and you have a strong sense of responsibility. Those expectations were in the back of mind as I went over your twenty-three pages of documentation. I think you have the program very well planned. I know it has been years in the planning.

I can imagine interesting avenues that might suggest a doctoral program, but would be hard to justify in the real world. Your existing program, with a prodigious output of high-quality publications and very ready placement of students, has filled educational needs so well in this field that the extension of it to the doctoral level hardly needs justification, but you have justified it very well. It seems to me there is a crying need for this program, just as you envision it.

I wish you the greatest success in initiating the program and moving forward with it. It could not be in better hands.

Very truly yours,

A handwritten signature in black ink, appearing to read 'C. S. McCamy'. The signature is fluid and cursive, with a long, sweeping tail that extends downwards and to the right.

C. S. McCamy

June 29, 2004

Dr. Roy S. Berns  
Munsell Color Science Laboratory  
Rochester Institute of Technology

Dear Roy:

I am responding to your request for support for a Color Science Doctorial Program at RIT. I support such a program for two reasons: it would be of value to the scientific, commercial and artistic segments of our society and it would be beneficial and appropriate for RIT to house such a program.

Color, being defined as purely a human attribute, is something that the vast majority of us with normal vision is blessed with. As such, it is a characteristic of life that we easily take for granted and we all know it for what we want it or expect it to be. The understanding, use and control of color have a profound influence in our daily lives and are of great economic and technical value. The Munsell Color Science Laboratory through its existing programs has already contributed greatly to the successful understanding and application of color in our daily lives as well as the gainful employment of its graduates and the reputation of RIT.

As we move more and more into the digital world the gathering and presenting of information is taking on new and more challenging dimensions. This is certainly true with color. Captured by digital cameras, produced with digital presses and printers and disseminated by inter net, web site and monitor all challenge our knowledge and understand of color. A program that addresses these concerns at the doctoral level is clearly desirable. Not only do we need to increase fundamental knowledge of the phenomenon of color but also its successful use and application. It was once suggested to me that color and weather are two attributes of life which we encounter daily and can be critical to our survival, yet we have insufficient knowledge about both of them.

The initial program suggested seems appropriate and should be sufficient to get the program started. As with any new venture there will undoubtedly be unforeseen problem, needed changes in direction and rough spots that need to be smoothed out but these can only be addressed once you start down the road in question. I have no doubt that RIT has or is capable of assembling the resources that such a program requires. I believe a doctoral program in color science will attract many qualified and capable candidates. The masters program at the Munsell Color Lab has already established a precedent for this and a doctoral program is a logical extension.

RIT has an established history and tradition in the field of imaging and associated technologies; a doctoral program in color science would be in keeping with this tradition. I believe such a program would be an attractive complement to the doctoral program in imaging science.

Sincerely,

Milton Pearson  
Graphic Arts Research (retired)  
RIT

**Rolf G. Kuehni**  
**4112 Blaydes Court**  
**Charlotte, NC 28226**

June 25, 2004

TO WHOM IT MAY CONCERN

I am writing in support of the proposed Ph. D. program in Color Science at the Rochester Institute of Technology. Despite having achieved a degree of maturity color science is an enterprise that continues to require much experimentation and thought to unravel many unresolved issues. The complexity of the issues and their connection to neurobiology and the study of consciousness require people at the Ph. D. level to unravel and understand the connections between perception and stimuli. It is already clearly evident that much of what now constitutes color science will need to be updated and modified or replaced in the future. Such efforts are not just needed in the visual science area but also at the interface between science and technology.

Rochester Institute of Technology and its Munsell Color Science Laboratory have an excellent institutional basis to play a leading role in this area. A Ph. D. program will help assure that the educational basis exists to keep developing this field.

Sincerely



Rolf G. Kuehni  
Adjunct Professor of Color Science  
North Carolina State University, Raleigh, NC

**Sun Chemical**  
**North American Inks**  
**Daniel J. Carlick Technical Center**  
**631 Central Avenue**  
**Carlstadt, NJ 07072**

July 7, 2004

Professor Roy S. Berns  
Munsell Color Science Laboratory  
Rochester Institute of Technology  
One Lomb Memorial Drive  
Rochester, NY

Dear Roy:

You ask me to comment on the proposed new program for a PhD in Color Science at RIT. I have read your proposal and the program description. I am firmly in support of your move to upgrade the program in Color Science from just the Master's degree level to both Masters and Doctoral levels.

I have been involved with the Industrial Advisory board at RIT for some years now as well as that at North Dakota State University. While at Datacolor, I was both a technical and financial contributor. Sun Chemical has been a supporter of the Center for Imaging Science and the School of Printing for many years but we have not been an active supporter of the Color Science program, aside from hiring one of your former students.

Sun Chemical is an active supporter of several collegiate research programs including ones at New York University, University of Maine, Eastern Michigan and Clemson University. In each of these schools it is the PhD program in chemistry, or paper or printing or polymers that Sun Chemical supports.

The value chain in the graphic arts work flow is a very interesting one. Much technology goes into the development of computer tools for imaging and image makeup, aesthetic design, prepress activities and the engineering of devices to transfer the electronic images to some useful substrate. But no value is actually added to product until the ink or toner is placed onto that substrate.

While it is not Sun Chemical's desire to place a PhD research fellow in every facility in the world, Sun Chemical does desire to have the highest level of trained personnel in critical positions in the R&D and Customer Support centers, both in North America and in Europe. At the moment, I am the only formally trained Color Scientist in Sun Chemical. This is not the case in our parent company, Dainippon Ink and Chemicals. They have a strong working relationship with Chiba University and support fundamental projects on color science within that institution as well as hiring some of the PhD students from there.

Sun Chemical wholeheartedly supports your effort to create a program focused on the measurement and modeling of the colorimetric properties of materials, including pigments, dyes and inks, and not just on the properties of electronic and photographic reproductions.

Sincerely,

**Danny C. Rich**

Danny C. Rich, PhD  
Color Research Laboratory

***National Gallery of Art***  
***Washington, DC***  
*Conservation Division*  
*2000B South Club Drive*  
*Landover, MD 20785*

Dr. Roy Berns  
R. S. Hunter Professor in Color  
Science, Appearance, and Technology  
Rochester Institute of Technology  
Munsell Color Science Laboratory  
Center for Imaging Science  
College of Science

June 24, 2004

Dear Roy,

I am very pleased to learn that RIT is considering a PhD program in color science. This is an exciting development for several fields: color science, art history and art conservation. As we've discussed, I think color science studies hold great potential for future research into works of art. As important as color is to works of art and their history, it has lacked significant scientific study and, unfortunately, very little is done in most conservation programs in the area of teaching color science. As a result of this there should be demands in both teaching and research for graduates of your program. As research via imaging technology expands and becomes commonplace in museums, there will be a growing need for trained researchers. I feel certain this will be the case at the National Gallery of Art.

The research opportunities offered by a PhD program will find ready application in art related studies. Conservation and scientific laboratories in museums can also provide post-doc fellowship opportunities for your graduates.

I am delighted with the prospects for the program and look forward to the National Gallery's continued joint programs with RIT.

With warm regards,

Ross Merrill  
Chief of Conservation  
National Gallery of Art