

NCAR Scientific and Research Engineering Appointments Criteria

Version 5/4/10

This document more fully describes the scientific and research engineering appointment criteria referenced in NCAR Scientific and Research Engineering Appointments Policy, 6-5. Each criterion is listed and a number of typical measures are provided which may be used to evaluate the nominee's record. These measures are provided for clarification and explanation of the scope of accomplishments that are considered when a scientist or research engineer is considered for promotion at NCAR.

Scientific/technical excellence is the fundamental and most important requirement in the NCAR Appointment process. The criteria for excellence are organized into three main categories:

- **Scientific/technical contributions**
- **Contributions to NCAR programs**
- **Community Service**

Accomplishments in all three categories are expected in the normal course of promotion.

1. Scientific/Technical Contributions

Excellence will be demonstrated by some substantial measure of the following characteristics:

- A. Productivity and creativity
- B. Leadership
- C. National/International Reputation and Awards
- D. Breadth

Level III - The candidate is nationally recognized in the relevant community for high scientific and research engineering competence and productivity, as well as for skills in managing scientific or engineering research programs and service activities when required by the position.

Senior Level - The candidate is internationally recognized in the relevant community for the quality of an individual's theoretical, technical, and numerical work; the extent that the work is set apart from, or above that of others in similar fields; and the impact or significance of the work in the field.

A. Productivity and creativity are measured by the rate at which significant new knowledge and/or goals are achieved. It is usually reflected in the publication record, in peer-reviewed journals, books, or other peer-reviewed outlets for the dissemination of scholarly and scientific activity. Other areas of productivity may include the development of new experiments, instruments, models, or software frameworks. Typical measures are:

- Publications
- New and innovative science, inventions, systems, cyber infrastructure or technologies
- Additional items from the *Curriculum Vitae*
- Citation Index
- Patents
- Grants

1. Scientific/Technical Contributions (cont.)

B. Leadership is measured by the extent to which the individual's work leads or is at the cutting edge in a field. It includes the ability to bring together groups internally, externally, nationally, and internationally, and/or to develop new and important undertakings. Measures may include:

- Recognition by peers of leadership role
- Appointments to scientific/technical/program committees in leadership positions
- Appointments to scientific/research engineering/technical/program leadership role at NCAR (e.g., section head, project leader)
- Staff supervision and mentorship

Level III - The candidate has demonstrated national leadership.

Senior Level- The candidate has demonstrated international leadership.

C. National/International Reputation and Awards assess the extent to which scientists and research engineers outside of NCAR recognize the individual's work and contributions, and identify with him/her as a peer. Measures may include:

- Opinions of peers
- Appointments to National Academy committees
- Awards and Honors
- Participation in national and international scientific/technical/advisory committees
- Prestigious invited talks and sponsored visitorships
- Editorships

D. Breadth is the assessment the individual's contributions to more than one scientific/technical activity. Measures can include:

- The range of scientific/technical research in which the individual is engaged
- Depth of research in more than one area

2. Contributions to NCAR Programs

An individual's contribution to the development and/or leadership of NCAR programs is measured in a number of ways:

- A. **NCAR Community Service**
- B. **Scientific, Research Engineering and Technical Service**

Level III - The candidate demonstrates a growing leadership role in NCAR programs.

Senior Level - The candidate has demonstrated effective judgment on the importance, relevance, and tractability of scientific or research engineering problems, on research strategy and development, and on development of facilities, models, and services for the scientific research community, which have influenced the shape and direction of NCAR programs.

- A. **NCAR Community Service**, in this context, measures the range of NCAR mission-based program activities in which the individual is engaged. Measures can include:
 - The extent that the individual participates in or leads multidisciplinary teams
 - Contributions to internal advisory mechanisms, e.g., NSA, ECSA, and Laboratory/Program Advisory Panels.
 - Leadership in developing and executing programs of importance to NCAR's mission and strategic priorities

- B. **Scientific, Research Engineering and Technical Service** assesses the relevance of an individual's research to NCAR's mission, and/or an individual's experience and knowledge and work with others in explaining how to use an NCAR facility/instrument/model in order to accomplish specific research objectives. It goes beyond a straightforward description of how to run a code or operate an instrument. Measures may include:
 - Assistance to users of NCAR's facilities, models, software frameworks, computing infrastructures, and/or instruments
 - Field program leadership, in either developmental or operational phases or both.

3. Community Service

The individual's contributions to the external atmospheric sciences community, through professional service or education and outreach activities may include:

- Supervising and/or mentoring students, serving on Ph.D. Advisory Committees, teaching courses and participating in less formal educational activities
- Service as journal editors, reviewers
- Service on:
 - professional society committees
 - review and steering committees
 - advisory boards and committees in other organizations
 - national or international committees that advance scientific policy or research
- Communication of science to society
- Direct interactions with industry, government, various societal and cultural groups

Appendices:

- Research Engineer Ladder
- NCAR Scientist Ladder

Description of NCAR Research Engineer Ladder

ELEMENT	Research Engineer I	Research Engineer II	Research Engineer III	Senior Research Engineer
Terms of Appointment	Nonrenewable term of not more than five years. In certain cases, the clock may be stopped or an extension granted. At the end of the term the incumbent faces an "up or out" decision.	Term appointment normally of not more than five years. In certain cases, the clock may be stopped or an extension granted. At the end of the term, the incumbent faces an "up or out" decision.	Appointments made by the NCAR Director without term.	Appointments made by the NCAR Director with approval by the UCAR Board of Trustees without term
Skills/ Focus of Job	Intended for a Ph.D. or equivalent at an early stage of a research engineering career. Carries out research in a field of importance to NCAR under the guidance of a higher-level research engineer or scientist and/or to apply his/her skills and knowledge to the achievement of the specific goals of a research or development project.	Carries out research in an engineering or technical field of importance to NCAR. These tasks and responsibilities may vary widely but include, as an essential element, collaborative or individual research contributions apparent through the creation of innovative devices or systems or publication in refereed journals and other appropriate literature, patents, and all or some of the following: 1) use of technical and leadership skills to develop and coordinate multi-participant research programs; 2) development of instruments, systems, or large software applications where the appointee may also participate as part of a team exploiting the instrument, system, or model for scientific research; and 3) collaboration with scientific users of UCAR facilities	The appointment is based upon demonstrated evidence, nationally recognized in the relevant community, of high engineering competence and productivity, as well as on skills for managing engineering research programs and service activities when required by the position. The candidate has an emerging international reputation. The excellence of the candidate's intellectual and engineering contribution in areas of NCAR interests is the fundamental criterion for appointment to Research Engineer III. Duties and responsibilities may vary widely, but always include, in substantial proportion, collaborative or individual research contributions to creation of innovative devices or systems, publication in refereed journals and other appropriate literature and, in addition, all or some of the following: 1) active participation at technical meetings; 2) a growing technical leadership role in internal UCAR programs and national scientific programs; 3) participation in national advisory committees or in the activities of professional societies; 4) development of instruments, systems, or large computer models where the appointee may also participate in the exploitation of the instrument, system or model for scientific research; 5) leadership or participation in providing engineering services for users of UCAR facilities, systems, or models; 6) contributions to educational programs, or 7) patents.	In addition to the requirements at the Research Engineer III level, the Senior Research Engineer will have achieved an international reputation for engineering accomplishments and leadership through some combination of highly influential inventions or developments, recognized and influential engineering publications, leadership in national and international programs or standards development, and service to the engineering community. In addition, the candidate must be judged to possess the breadth, flexibility, and judgment needed to sustain a role in the long-term engineering and technical leadership of UCAR. Performs all tasks and duties described under Research Engineer III with greater emphasis on leadership and participation in programs, societies and committees of national or international significance. The shape and direction of UCAR/NCAR labs/divisions and programs are influenced by the judgment of UCAR/NCAR Senior Research Engineers on the importance, relevance, and tractability of engineering problems, on technical strategy and development, and on development of facilities, models, systems, and services for the atmospheric science community. Required contributions at the Senior Research Engineer level are the development of new and innovative inventions or systems, technologies, patents and the dissemination of original publications.

*NOTE: Level I & II terms updated June 2013

Description of NCAR Scientist Ladder

ELEMENT	SCIENTIST I	SCIENTIST II	SCIENTIST III	SENIOR SCIENTIST
Terms of Appointment	Nonrenewable term of not more than five years. In certain cases, the clock may be stopped or an extension granted. At the end of the term the incumbent faces an "up or out" decision.	Term appointment normally of not more than five years. In certain cases, the clock may be stopped or an extension granted. At the end of the term, the incumbent faces an "up or out" decision.	Appointments made by the NCAR Director without term.	Appointments made by the NCAR Director with approval by the UCAR Board of Trustees without term
Skills/ Focus of Job	Intended for a Ph.D. or equivalent at an early stage of a scientific career. Carries out research in a field of importance to NCAR under the guidance of a higher-level scientist and/or to apply his/her skills and knowledge to the achievement of the specific goals of a research or development project.	Conducts and supports research on scientific or technical leadership. These tasks and responsibilities may vary widely but include, as an essential element, collaborative or individual research contributions to recognized refereed journals and other appropriate literature, and all or some of the following: 1) use of scientific and leadership skills to develop and coordinate multi-participant research programs; 2) development of instruments or large computer models where the appointee is to participate as part of the team exploiting the instrument or model for scientific research; and 3) collaboration with scientific users of UCAR facilities.	<p>The appointment is based upon demonstrated evidence, nationally recognized in the relevant community, of high scientific competence and productivity, as well as on skills for managing scientific research programs and service activities when required by the position. The candidate has an emerging international reputation. The excellence of the candidate's scientific contribution in areas of NCAR's interests is the fundamental criterion for appointment to Scientist III.</p> <p>Duties and responsibilities may vary widely, but always include, in substantial proportion, collaborative or individual research contributions to refereed journals and other appropriate literature and, in addition, all or some of the following: 1) active participation at scientific meetings; 2) a growing scientific leadership role in internal NCAR programs and national scientific programs; 3) participation in national advisory committees or in the activities of professional societies; 4) development of instruments or large computer models where the appointee is to participate in the exploitation of the instrument or model for scientific research; 5) leadership or participation in providing scientific services for users of UCAR facilities; 6) contributions to educational programs or 7) patents.</p>	<p>In addition to the requirements at the Scientist III level, Senior Scientist will have achieved an international reputation for scientific accomplishment and leadership through recognized and influential scientific publications, participation in national and international programs, and service to the scientific community. In addition, the candidate must be judged to possess the breadth, flexibility, and judgment needed to sustain a role in the long-term scientific and technical leadership of NCAR.</p> <p>Performs all tasks and duties described under Scientist III with greater emphasis on leadership and participation in programs of national or international significance. The shape and direction of NCAR programs are influenced by the judgment of NCAR Senior Scientists on the importance, relevance, and tractability of scientific problems, on research strategy and development, and on development of facilities, models, and services for the scientific community.</p>

*NOTE: Level I & II terms updated June 2013

