

are generated by the proposal writer on what research to be performed and how. All proposals submitted must be in accordance with the programs and objectives listed below. Grants awarded under the Fire Research Grants Program will generally provide financial assistance to a recipient without substantial NIST involvement in the projects. Cooperative Agreements awarded for Fire Research Grants Program projects will generally involve a close working relationship between a group of NIST experts and the recipient.

### Program Description

A. Fire Modeling and Applications: Performs research, develops, and demonstrates the application of analytical models for the quantitative prediction of the consequences of fires and the means to assess the accuracy of those models. This includes: Developing methods to assess fire hazard and risk; creating advanced, usable models for the calculation of the effluent from building fires; modeling the ignition and burning of furniture, contents, and building elements such as walls; developing methods of evaluating and predicting the performance of building safety design features; developing a protocol for determining the accuracy of algorithms and comprehensive models; and development data bases to facilitate use of fire models.

b. Large Fire Research: Performs research on and develops techniques to measure, predict the behavior of, and mitigate large fire events. This includes: Understanding the mechanisms of large fires that control the gas phase combustion, burning rate, thermal and chemical emissions, transport processes; developing techniques for computer simulation; developing field measurement techniques to assess the near and far field impact of large fires and their plumes; performing research on the use of combustion for environmental cleanup; predicting the performance and environmental impact of fire protection measures and fire fighting systems and techniques; developing and operating the Fire Research Grants Program large scale experiment facility.

c. Smoke Dynamics Research: Produces scientifically sound principles, metrology, data, and predictive methods for the formation/evolution of smoke components in flames for use in understanding and predicting general fire phenomena. This includes: Research on the effects of within-flame and post-flame fluid mechanics on the formation and emission of smoke, including particulates, aerosols, and combustion gases; understanding the mechanistic pathway for soot from chemical

inception to post-flame agglomerates; developing calculation methods for the prediction of the yields of CO (and eventually other toxicant) as a function of fuel type, availability of air, and fire scale.

d. Materials Fire Research: Performs research to understand fundamentally the mechanisms that control the ignition, flame spread, and burning rate of materials and the chemical and physical characteristics that affect these aspects of flammability; develops methods of measuring and predicting the response of a material to a fire. This includes: Characterizing the burning rates of charring and non-charring polymers and composites; delineating and modeling the enthalpy and mass transfer mechanisms of materials combustion; and developing computational molecular dynamics and other mechanistic approaches to understand the relationships between polymer structure and flammability.

e. Fire Sensing and Extinguishment: Develops understanding, metrology, and predictive methods to enable high-performance fire sensing and extinguishment systems; devises new approaches to minimizing the impact of unwanted fires and the suppression process. This includes: Research for the identification and *in-situ* measurements of the symptoms of pending and nascent fires or explosions, and the consequences of suppression; devising or adapting monitors for these variables and creating the intelligence for timely interpretation of the data; determining mechanisms for deflagration and detonation suppression by advanced agents and principles for their optimal use; modeling the extinguishment process; and developing performance measures for the effectiveness of suppression system design.

*Award Period:* Proposals will be considered for research projects from one to three years. When a proposal for a multi-year award is approved, funding will be provided for only the first year of the program. There is no definite commitment to fund future years of the project. The work performed during the year being funded must represent solid accomplishments if prospective funding is not made available to the applicant.

*Matching Requirements:* The Fire Research Grants Program does not involve the payment of any matching funds and does not directly affect any state or local government.

*Eligibility:* Academic institutions, non-Federal agencies, and independent and industrial laboratories are eligible to apply.

*Proposal Review Process:* All proposals are assigned to the

appropriate group leader of the five programs listed above for review, including external peer review, and recommendations on funding. Both technical value of the proposal and the relationship of the work proposed to the needs of the specific program are taken into consideration in the group leader's recommendation to the Deputy Director. Applicants should allow up to 60 days processing time. Proposals are evaluated for technical merit by at least three professionals from NIST, the Building and Fire Research Laboratory, or technical experts from other interested government agencies; and experts from the fire research community at large.

#### *Evaluation Criteria:*

- a. Rationality: 0-20.
- b. Qualification of Technical Personnel: 0-20.
- c. Resources Availability: 0-20.
- d. Technical Merit of Contribution: 0-40.

*Selection Procedure:* The results of the evaluations are transmitted to the group leader of the appropriate research unit in the Building and Fire Research Laboratory who prepares an analysis of comments and makes a recommendation. The Building and Fire Research Laboratory will also consider compatibility with programmatic goals and financial feasibility.

*Paperwork Reduction Act:* The Standard Forms 424, 424A, 424B, and LLL mentioned in this notice are subject to the requirements of the Paperwork Reduction Act and have been approved by the Office of Management and Budget (OMB) under Control Numbers 0348-0043, 0348-0044, 0348-0040, and 0348-0046.

*Application Kit:* An application kit, containing all required application forms and certifications is available by calling Sonya Cherry, NIST Fire Research Grants Program (301) 975-6854. An application kit includes the following:

- SF-424 (Rev 4/92)—Application for Federal Assistance
- SF-424A (Rev 4/92)—Budget Information—Non-Construction Programs
- SF-424B (Rev 4/92)—Assurances—Non-Construction Programs
- CD-511 (7/91)—Certification Regarding Debarment, suspension, and Other Responsibility Matters; Drug-Free Workplace Requirements and Lobbying
- CD-512 (7/91)—Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusions—Lower Tier Covered Transactions and Lobbying
- SF-LLL—Disclosure of Lobbying Activities