Discussion, Tuesday, March 25, 2002.

Bartolo—discussion points.

1. Contents.
    a. What
    b. How to start now
    c. Format
2. Advisory Board
3. Solicit contributions
    a. Evaluate? Assure quality
    b. How to give recognition
4. Other issues
    a. Sustainability
    b. Property rights/copyright
    c. Connect to other digital libraries
5. Electronic Newsletter (suggested by Beck); connect to professional societies?

CONTENTS
Bartolo: Original proposal: Problem bank; research bank; teaching bank.

Beck: solicit tables of GF
Tewary: tutorials needed, persuade authors to include them?
Ting: References assembled so far do not include heat transfer
Berger: Kythe "Fundamental Solutions of Differential Operators" has a good organization by the type of differential equations. Also need to include methodology for finding GF for educational purposes.
Lutz: "expression" on web – should include a link to code to explain it or make it computer processable.
Martin: people putting things on the web might not be useful for others. What I want when I approach a "library" is: What has been done before?
Lutz: What math tools do people use? Maple, Mathematica, etc?
(Martin: "I use graduate students")
Shreve: Yesterday the group made presentations to colleagues, can continue this 24-7 on the web.
Martin: Who knows the literature—find out if problem is solved before proceeding.
Mitra. Who is the audience—why would someone come to the web site, and why would they come back? Is the web site "sticky"? What does each audience need? Audiences could include: grad students, BEM students, grad students doing research, established researchers, industry, distance education in industry.
Barnett: How can we survey to learn about audiences?
Cole: One measure of a web site's value is in the number of sites that link to it. We need to contact other sites, Yahoo, etc., and request links.
Berger: Any other NSDL efforts on engineering problems? (yes—one).
Rudolphi: This started as a repository of *numerical* solutions. It has evolved into a "GF society" leaning toward analytical solutions.
Beck: We should think broadly, include many things.
Lutz: likes the name "professional society"
Berger: start by including solutions to partial differential equations, then as GF are available, what are the references for the solutions. (not ordinary diff eq.)
Bartolo: Could we start with a small pilot project? What equations should be included? (elastic equations; heat equation)
Mitra: An alternate approach would be to focus on "integral equation method" for solving problems.
Gray: would like to see code included, reusable bits would be most valuable

Bartolo: Netlib is a code repository—work with them? (they have an existing review process we could learn from). Netlib also has a boundary element package.
Beck: Interested in tables of integrals and subroutines to numerically evaluate intractable integrals.
Martin: What diff. eq. does the GF satisfy?

- how does the GF behave near the singularity
- or, what is the coefficient in front of the delta function

Mitra: Classify information first by hyperbolic/elliptic/equation type. Then by 2D, 3D geometry; coordinate system, etc.
Cole: Whatever words are used to categorize things, they should be backed up by math to specify which differential equation it solves.
Ting: Classify by physical application: physics of the problem, elasticity, heat equation, acoustics.
Shreve: In a searchable web site, people can find what they need through several classifications systems which are not mutually exclusive.
Lutz: What exists on graph theory, in which comparable classification problems are addressed.

ADVISORY BOARD
Bartolo's suggestions for the responsibilities of the Advisory Board:

- contribute to collection
- solicit contributions
- evaluate contributions
- recognize contributions (how does one note it in one's c. vita?)

Beck: Does NIST have restrictions on links to other sites?
Tewary: Yes. A link does not imply recommendation. NIST site cannot include copyrighted material.
Powell: There could be several levels of material on the site: Raw submissions; items annotated but not reviewed; formally reviewed items.
Bartolo (echoes Powell)
Shreve: There will be evolution of sources over time. Tools are needed to easily annotate material on the site and to give feedback to submitter.
Lutz: A research lab in NJ that we could learn from (Fujitsu?) has a site with containing references, links, annotated material.
Shreve: Access to the library is determined by NSDL. There may be conflicts with NIST requirements, but these could be resolved by a mirror site outside NIST.
Beck: The Advisory Board to direct the grant should be small; the Editorial Board to oversee submissions should be larger.
Cole: (echoes Beck).

(BREAK)

Post Break.

Powell: presentation of "GF Mark up Language"
Other points discussed after presentation: inclusion of benchmarks, plots, BEM code, citations.

Beck: There are more than one form of some GF, can this be included? Also derivatives and integrals of GF are important.
Shreve: A mockup of this could be done quickly in XML and tried out over email.
Tewary. Let's set up a protocol.

Bartolo: Sustainability
a. Longterm survival
b. Maintainence (2 yr NSF support)
Martin: any precendents?

Bartolo: In the NSF proposal, professional education was listed as a source of income, if industry needs for staff development could be met for a fee.
Barnett: What costs are we talking about?
Shreve:

1. hosting (NIST will do it),
2. acquisition/editorial process/ entering data into the database; these depend on the computer tools available for submission
3. Expenses covering meetings of an executive committee.

Mitra: Is the web site "alive"? If people see evidence the site is changing, then people will return to the site. Could we pick up journal-paper titles and enter them into the GF bibliography in a timely manner? For example, the Applied Mechanics Review lists journal contents.
Ayari: Could there be automatic notification of new material via email?
Shreve: Editing tools are needed for the executive committee
Bartolo: The IEEE has an ongoing professional development effort. Their outreach is in place to offer modules for a fee to industry.
Rudolphi: National Tech. University here in Boulder has an enrollment over 100,000. Is there anything there to learn from?
Powell: Some web sites are supported by advertising. Codes that are not open source could not be listed, but could the site get a fee for listing a link? Could those interested in doing consulting be charged for advertisements? Could we seek corporate sponsorships?
Barnett: Earlin Lutz's vision of automatic code development is something we need to strive for to reduce the amount of human labor needed to upload and maintain the web site.
Mitra: Can we get a special domain name?

Discussion of Executive Committee:
Purpose: To advise both the NSF proposal activity and the editorial board of the GF web site.

Ayari: There should be 50% academics, 30% industry, and 20% industry on this committee.
Cole: That makes a minimum of 6 people, 3 academics, 2 industry, and 1 government lab.
Barnet: We also need information technology represented, especially after the NSF grant runs out.

After nominations and discussion that voting is not needed, the following names were put forward:
Berger, Powell, Cole (academe)
Avari, Gillis (industry)
Bartolo/Shreve (information technology)
Tewary, Gray (government)

All agreed to serve.