What could dark matter be?

12/01/15 | By Laura Dattaro

Scientists don't yet know what dark matter is made of, but they are full of ideas.

U.S. particle physics communication

K. Yrukewicz
Fermilab
December 10, 2015
Communication goals

**Support**  Ensure that the U.S. particle physics community has the resources necessary to conduct research and maintain a world leadership role.

**Appreciation**  Ensure that the U.S. public appreciates the value and excitement of particle physics.
Reaching our audiences

**Media**
- Proactive media outreach
- Media interviews
- Scientist-written articles, blogs, videos, op-eds...
- Journal articles & conference presentations

**Public**
- Public talks
- Fairs, festivals & open houses
- Social media & blogs
- Symmetry & other institutional publications

**Decision makers**
- Visits to policy makers
- Washington events
- Letter-writing campaigns
- Targeted communication products

**Branding & messaging & packaging**
Learning from other fields: NASA

Where NASA excels

• Purposeful, compelling & consistent messaging
• Noble purpose supported by many programs
  - Next Giant Leap
  - Journey to Mars
  - Search for Life
• Stunning multimedia
• Great spokespeople
• Fun & innovative communications

How they do it

• Commitment to communication excellence at all levels
• Strong central public relations/outreach/design teams
• Far-in-advance planning & preparation
• Coaching and training for scientists and spokespeople
• $$$$
Learning from other fields: Biosciences

Where they excel

• Making an immediate connection to people’s lives
• Personalizing their research
• Beautiful imagery

How they do it

• Willingness to talk about the ultimate goal rather than the immediate details
• Featuring people & their stories whenever possible
• Culture of great visualizations (& contests!)

1st Place
Chiara Peres
Istituto Italiano Tecnologia

2nd Place
Heidi Koldso
University of Oxford

3rd Place
Anthony Vecchiarelli
NIDDK, NIH
Where would particle physics be if we…

- Fully committed to out-communicating NASA?
- Worked together as a field to deliver consistent, compelling messages to the right people at the right time?
- Were supported by a first-class, centrally coordinated communications, outreach and multimedia team?
- Recognized the critical importance of extraordinary images?
- Planned and tested our communications?
- Made outstanding communication as easy as possible?
- Rewarded and encouraged communication excellence?
Elements of this vision exist

We excel at capturing the imagination and inspiring the public

• Our science goals, project scales inspire, amaze and fascinate
• When particle physics has something (big) to say, the world sits up and listens
• This makes us the envy of many other fields!
Elements of this vision exist

Working together to deliver consistent messaging

- Unification of U.S. community around P5 report
  - Letter signed by 2,331 people tangible evidence of huge effort to build and demonstrate consensus
  - Particle physics held up as “best practice” for other fields to follow in their planning process
- Recognition that consistency must continue “post-P5”
  - Progress towards community-driven messaging described earlier by Jim Siegrist and tomorrow by Steve Ritz
- Annual spring D.C. visit by Fermilab/SLAC/US LHC users has long included consistent messaging, training and practice
Elements of this vision exist

Centrally coordinated communications team

- Symmetry Magazine team based at Fermilab and SLAC working on behalf of the U.S. community since 2004
- US LHC communicator based at CERN since 2006; communicates on behalf of entire US LHC effort
- DOE HEP hire of program manager for strategic planning and communications
- Strong networks in place among international particle physics lab communicators (Interactions) and DOE national lab communicators (several groups)
Elements of this vision exist

Compelling messages and graphics delivered in a fun, innovative way: Symmetry Magazine leads the way!

**Fully online in 2013**

<table>
<thead>
<tr>
<th>FY2013</th>
<th>FY2014</th>
<th>FY2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>500,000</td>
<td>1,000,000</td>
</tr>
<tr>
<td>1,000,000</td>
<td>2,000,000</td>
<td>2,500,000</td>
</tr>
</tbody>
</table>

**Top pages of 2015**

1. Homepage .................................................. 125,954
2. Ten things you might not know about antimatter .................................................. 82,872
3. Physics Valentines .......................................... 44,268
4. How to build your own particle detector .................................................. 40,661
5. Particle physics personality quiz ..................................... 29,291
6. Ten things you might not know about particle accelerators ................................ 26,822
7. Standard Model (interactive) ...................................... 23,189
8. Our flat universe .................................................. 19,496
9. Is this the only universe? ......................................... 18,493
10. Something goes bump in the data ...................................... 16,654

Kathryn Jepsen, Editor-in-chief: kjepsen@slac.stanford.edu
Where must we improve? Coordination & planning

- Developing a compelling noble purpose and showing how pieces support
- Planning ahead for project/experiment communication
- Working together in an atmosphere of mutual trust
Where must we improve? **Lowering barriers**

• Overcome the #1 barrier – time – by making it as easy as possible for people to communicate

• Communication resources that are easy to access

• Trainings online and in person in places scientists already go

• Easy-to-find opportunities for communication/outreach
Where must we improve? Compelling messages

Particularly about our value to society

- Workforce development
- Previous spin-offs
- Potential applications
- Science goals

2013 Snowmass Communication, Education and Outreach Survey. 641 total respondents.
Value to society: Our communication comfort level

2013 Snowmass Communication, Education and Outreach Survey. 641 total respondents.
Where must we improve? **Outstanding graphics**

- **ATLAS and CMS**
  LHC Run 1
  Preliminary

- Oscillation probabilities for an initial electron neutrino

- Quarks
  - $u$, $c$, $t$
  - $d$, $s$, $b$

- Forces
  - $W^+$, $W^-$
  - $Z$
  - $g$

- Leptons
  - $\nu_e$, $\nu_\mu$, $\nu_\tau$

---

CERN

Fermilab

Wikipedia via Wolfram Demonstrations
Recommendation to achieve the vision

Assemble a centrally coordinated communications, outreach and multimedia team tasked with lowering barriers to excellent communication nationwide, including:

– Nationwide coordination of and support for communications activities, including strategy development and messaging
– Developing a comprehensive central communication and outreach website for physicists
– Communication training for the U.S. particle physics community (at conferences, meetings…)
– Helping the community develop first-class multimedia
– Increasing frequency of communication activities aimed at decision makers
– Augmenting, not replacing existing efforts
Communication landscape

- Universities
- Societies
- Funding agencies
- Labs
- Media
- Decision Makers
- Public
Barriers to greater comms/outreach participation

2013 Snowmass Communication, Education and Outreach Survey. 641 total respondents.
# NASA and DOE public affairs funding

<table>
<thead>
<tr>
<th>FY14 Funding</th>
<th>DOE</th>
<th>NASA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agency total</td>
<td>$27</td>
<td>$17.6</td>
</tr>
<tr>
<td>Science total</td>
<td>$5</td>
<td>$5.1</td>
</tr>
<tr>
<td>Headquarters Public Affairs</td>
<td>$3.6</td>
<td>$14.4</td>
</tr>
<tr>
<td>Public Affairs total</td>
<td>$3.6</td>
<td>$14.4</td>
</tr>
</tbody>
</table>

$47.3