Deep Roots, Broad Branches: Growing a Multidisciplinary Field

Jennifer Shirk, PhD
Interim Executive Director
Citizen Science Association

CitizenScience.org
@CitSciAssoc
JLS223@cornell.edu
@ShirkSci
Deep Roots
\[
F(X, s, t) = \frac{1}{n(s, t)} \sum_{i=1}^{m} f_i(X, s, t) I(s, t)
\]
The Celestron 10
Schmidt Cassegrain Telescope

There are few possessions that the individual can aspire to which will match the pride of ownership, the lasting utility, and freedom from obsolescence of the Celestron 10. The proud owner of this fine instrument will find it to be the center of attraction at star parties attended by amateurs and professionals alike. Think of the enjoyment you will realize when showing your friends, neighbors and youngsters their first truly impressive view of the moon, planets, or remote nebulas.

Features:
- Clear Aperture: 10" (254 mm)
- Tube Length: 80" (2032 mm)
- Carrier: 6½ ft (2 m)
- Weight (less finder): 265 lbs (119.9 kg)
- Telescopic tube: 1½" (38 mm)
- racked drive with 6½" worm gear
- Manual worm motion control
- Larger Newtonian Collimator
- Portable pier with adjustable wedge.

The Celestron 10 is truly a giant in performance, in spite of its compact design. Masterpieces in a telescope of its class, it is designed for stability, ease of handling, and its portability. The compact design and good mount give the performance usually found only in massive observatory instruments. Professional observatory standards were the guide in the design of the Celestron 10, yet it is within the budget of the average amateur.

Complete as shown: $1070.00

Celestron Pacific
13214 Crenshaw Boulevard, Gardena, California,
Telephone (213) 436-6160
Clean Air Coalition of Western NY:
Tonawanda Air Quality Study
Broad Branches
ZOOVERSE

Galaxy Zoo
Help us discover the secrets of galaxy evolution by classifying distant galaxies.
View Project

Chimp & See
Discover the secret life of chimpanzees. We need your help to study, explore, and learn from.
View Project

Shakespeare's World
Transcribe handwritten documents by Shakespeare's contemporaries and help us understand his life and work.
View Project

Muon Hunter
Help astronomers to find elusive muons disguised as gamma rays.
View Project

The Zooniverse Works

382,343,885
Classifications so far by 1,607,712 registered volunteers.
Scientific COMMUNICATION is broken.

Scientific literature is growing at a rate of more than 2 new articles every single minute. It is impossible for scientists to consume and understand the rapidly expanding ocean of biomedical literature. You can help biomedical researchers find the information they need to discover cures faster.

YOU can fix it and help find cures.
Strong Core
What you see is NOT always what you get

THE RED SNAPPER POPULATION IS THIS BIG!
SAFMC Citizen Science Program Blueprint

Vision Statement:
“more collaboration + more data + more trust = better management”

Mission Statement:
“Improve fisheries management through collaborative science”
1. *Everyone* involved values the pursuit of meaningful science

2. Evidence indicates advances in scientific knowledge, public engagement, and policy change

3. Achieving these outcomes requires careful, intentional work
(Strong Core?)
“Citizen science must not become what its critics claim it to be: poor science with great communication potential.”
Public participation: Time for a definition of citizen science

"... we call for the standardization of citizen science."

"... we need a rigorous definition of method ..."
1. Definitions
2. Standards
3. Principles
4. Frameworks
5. Connections
Ten principles of citizen science

- A concept which can be adapted and applied within various disciplines and project types.
- Developed by the Natural History Museum of London and the European Citizen Science Association.

Dieci principi di Citizen Science

- Un concetto flessibile che può essere adattato e applicato in varie discipline.
- Acquisito ai Musei di Storia Naturale di Londra e dell’Associazione Europea di Scienza di Cittadinanza.

Diez principios de ciencia ciudadana

- Una declaración flexible que se puede adaptar y aplicar en varias disciplinas.
- Acordado por el Museo de Historia Natural de Londres y la Asociación Europea de Ciencia Ciudadana.

Diez principios de ciencia ciudadana

- Un concepto flexible que se puede adaptar y aplicar a diversas disciplinas. Las declaraciones que se presentan en este documento han sido desarrolladas por la Asociación Europea de Ciencia Ciudadana (ECSA) y el Museo de Historia Natural de Londres.

Dix principes de sciences participatives

- Un concept flexible qui peut être adapté et appliqué dans de nombreuses situations.

Zehn Prinzipien von Citizen Science – Bürgerwissenschaft

- Ein flexibler Ansatz, welcher von Praxiserfahrungen und Kapazitätenentwicklung inspiriert wird.
- Von der Natural History Museum of London und der European Citizen Science Association entwickelt.

Charakteristik dieser Dokumente:

- Das Dokument ist eine Übersetzung der Ten principles of citizen science in verschiedene Sprachen.

Charakteristik der Übersetzungen:

- Die Übersetzungen sind präzise und loyal der ursprünglichen Text in englisch befolgen.
- Sie verwenden die gleichen terminologischen und stilistischen Merkmale der Originalsprache.

Charakteristik des originalen Textes:

- Der ursprüngliche Text umfasst zehn Prinzipien für die Bürgerwissenschaft.
- Die Prinzipien sind multidisciplinär und sollen auf verschiedene Projekte und Situationen anwendbar sein.

Charakteristik der Entwicklung:

- Die Prinzipien wurden in Zusammenarbeit zwischen der Natural History Museum of London und der European Citizen Science Association entwickelt.
- Sie berücksichtigen die Erfahrungen aus verschiedenen Projekten und die Kapazitätenentwicklung.

Charakteristik der Übersetzungen:

- Die Übersetzungen in verschiedene Sprachen sind präzise und korrekt.
- Sie befolgen die Konventionen der ursprünglichen Sprachversion.

Charakteristik der Nutzer:

- Die Dokumente sind für alle Nutzer gedacht, die an der Bürgerwissenschaft interessiert sind.
- Sie sind nutzbar für Forscher, Praktiker, Politiker und allgemeine Interessierte.

Charakteristik der Prinzipien:

- Die Prinzipien sind flexibel und können auf viele verschiedene Situatio
1. Citizen science projects actively involve citizens in scientific endeavor that generates new knowledge or understanding.

2. Citizen science projects have genuine science outcome.

3. Both the professional scientists and the citizen scientists benefit from taking part.

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Participant engagement

<table>
<thead>
<tr>
<th>Identify goals</th>
<th>Science, Policy/action, Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establish capacity</td>
<td>Staff, Volunteers, Partners</td>
</tr>
<tr>
<td>Design/refine</td>
<td>Question/protocol, Training, Infrastructure</td>
</tr>
<tr>
<td>Manage</td>
<td>Participation, Data, Expectations</td>
</tr>
<tr>
<td>Apply &amp; adapt</td>
<td>Research/action, Determine effectiveness, Transparency</td>
</tr>
</tbody>
</table>

Sustainability/accountability

(Shirk and Bonney 2015)
Growing a Multidisciplinary Field of Practice
The power of citizen science

Citizen science is the involvement of the public in scientific research—whether community-driven research or global investigations. The Citizen Science Association unites expertise from educators, scientists, data managers, and others to power citizen science. Join us, and help speed innovation by sharing insights across disciplines.

over 1K
Projects

over 1M
Volunteers

over 4K
Members

Citizen Science News

Blog Posts  Social Feed  Opportunities
CitSci 2019
GROWING OUR FAMILY TREE
Raleigh, NC | March 13-17
Jennifer Shirk, PhD
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CitizenScience.org  JLS223@cornell.edu
@CitSciAssoc       @ShirkSci
Goals:

- E
STALLS CAN REDUCE OVERALL BLOOD FLOW IN THE BRAIN BY 30% - SIMILAR TO A HEADRUSH WHEN STANDING UP TOO QUICKLY.

IF WE COULD PREVENT OR REMOVE STALLS WE COULD FIND THE FIRST EVER ALZHEIMER'S TREATMENT. BUT WE NEED YOUR HELP!

Read more about the science behind Stall Catchers here.
Other organizations look in-depth at aspects of the practice (such as environmental education or data management) or the practice in certain disciplines (such as ecology or public health). We build strategic partnerships to facilitate a) the necessary attention to multiple dimensions of this practice, and b) the transfer of knowledge across disciplines.

**Requires collaboration for maximum impact.**
Connections
• Brief history (and why that matters today)
• Power and promise
  – by building knowledge together, cs can advance shared understandings...
• How is this possible? Intertwined nature of practices
  – power of science to everyone, and the power of everyone to science.
  – Achieving this promise is hard. And highly under-appreciated. so, there’s...
• Buzz. But, risk of buzz-word.
  – the risk that carries...
  – the opportunities it offers us...
So what is the same?

How do differences matter?

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TENSIONS:
Standards (Austria, SAFMC)
Diversity and Innovations

Depth vs breadth

---

So we are perhaps at a crux... how might we address this?
STRATEGIES:
Definitions (pros/cons)
Standards (pros/cons)
Frameworks/models (pros/cons)
Connections, conversations, collaborations...
(pros/cons)
These are few possessions that the individual can aspire to which will match the pride of ownership, the lasting utility, and freedom from adolescence of the Celestron 10. The proud owner of this fine instrument will find it to be the center of attraction at star parties attended by amateurs and professionals alike. Think of the enjoyment you will realize when showing your friends, neighbors, and youngsters their first truly impressive view of the moon, planets, or remote nebulae.

The Celestron 10 is truly a giant in performance. In spite of its compact design, maneuverability, it is light in weight. Its inherent stability of short-base construction and fork mount gives it the ability to perform equally well as a go-to or tracking instrument. Professional obsever would standed the guide to the design of the Celestron 10: yet it is within the budget of the serious amateur.

Celestron Pacific
13214 Crenshaw Boulevard, Gardena, California,
Telephone (213) DA 3-6160

$1875.00

Features
Clear Aperture: 10" Take Length: 22" Carrying Case: C-150
Weight (clean instrument): 55 lbs. Short axis flat aluminum field. Great for use with the 1.25" eyepiece, manual slow motion control, optional N-S. Caste, possible pier with adjustable wedge.