# A Well Kept Secret. . .

Ohad Kammar
<ohad.kammar@ed.ac.uk>

January 19, 2010

## Abstract

At the end of last year, a prominent Category Theorist revealed a well kept secret on the categories mailing list. I will present a brief overview of the various threads that erupted from this revelation, and how they are relevant to Your Research$^{TM}$.

# A secret revealed. . .

On a frosty winter day, in a land far, far away, a wise scholar has decided to share some of his thoughts with the rest of the world. . .

**André Joyal**                                                    7/12/09
```
Category theory is a powerful mathematical language.
It is extremely good for organising, unifying and
suggesting new directions of research.
It is probably the most important mathematical
development of the 20th century.
But we can't say that publicly.
```

# Undesirable effect

**Michael Barr** 21/12/09

[.. a colleague's] reply essentially was, ``Oh, it's category theory language. Well, I won't allow any of that in MY notes. No analyst would use that language.''

# Gain. . .

- a glimpse into some categoriests' view of themselves. . .
- experience: can this happen to me? How to avoid this?

**Thorsten Altenkirch**                                      23/12/09

Category Theory helps us to structure abstractions.
In Computer Science and in other areas (e.g.
Physics).  Some people seem to think that
abstractions don't buy you anything concrete.  E.g.
they don't deliver faster algorithms or new physical
theories.  These people often overlook that
everything they do relies essentially on abstractions
which have been established a while ago.
Hence, while it is hard to measure the impact of
abstractions exactly, IMHO it is almost impossible to
underestimate their value.

# Is it really important? Design patterns

**Zinovy Diskin**                                       13/12/09

Design from scratch is for geniuses while ordinary
people design by adapting and developing preexisting
patterns.  Category theory created a powerful system
of design patterns for math and beyond (computer
science, physics, engineering).  It seems it changed
the very nature of mathematical design.

# Is it the most important?

Is it "`probably the most important mathematical
development of the 20th century`"?

Nearly unanimous consensus: too early to tell. . . (and this is on the
categories mailing list!)

# Is it the most important?

**Paul Taylor**                                      10/12/2009

```
I think we should be wary of slapping ourselves on
the back too much.
The fact is that category theory alienated the rest
of the mathematical world.  [..]
Probably it was the result of haughty claims about
being the ''most important mathematical
development'', and about being the foundations of
mathematics before any serious technical work was
done to justify this.
```

# Is it secret? No!

**Steve Vickers** 8/12/09

I think category theorists have done an excellent job
at publicizing the secret. I am very much struck at
category meetings --- what a variety of backgrounds
the participants come from: lots from computer
science of course, and now increasingly many
physicists. It seems to me this is exactly because
category theory has the qualities you describe. It
enables the pure category theorists, the computer
scientists, the physicists to meet and talk together
with a high degree of mutual understanding.

**Charles Wells** 9/12/09

Category theory is definitely out of the closet. A
substantial number of the questions on MathOverflow
involve categorical concepts and many of them are
questions about category theory itself, not merely
applications.

# Is it secret? No! Yes?

**Charles Wells**                                              9/12/09

```
Category theory is definitely out of the closet.  A
substantial number of the questions on MathOverflow
involve categorical concepts and many of them are
questions about category theory itself, not merely
applications.
```

**David Spivak**                                              8/12/09

```
I think we should say it publicly.  Gays get to have
gay pride, why shouldn't categorists get to have
category-theory pride?  Perhaps we've just been in
the closet too long.  I think it's the right thing to
do to explain to people that this stuff is
interesting and worthwhile to us.
```

# Is it secret? Perhaps...?

**John Baez** 15/12/09

Seriously, I think the so-called ''secret'' is the power and glory of category theory. And I think some of the older category theorists on this mailing list have a different attitude than youngsters like you and me. They fought to convince the world that category theory was worthwhile. Some feel they lost that fight. We came along later and are a bit puzzled by that attitude: if you look around at the landscape of mathematics today, categories are everywhere!

# Is it secret? Yes!

**Paul Taylor**                                          10/12/09

[..] category theory is a WELL KEPT SECRET. Secrecy, like charity, begins at home.

[.. some CT work] was done THIRTY SIX YEARS AGO, and many people since then have been nagging the author to write it up, indeed I myself have been doing so for half of that time now.

[..] Anybody in my generation or younger [older?] can cite lots of examples of ''well known'' ''folklore'' results that were supposedly discovered in the 1970s but have never been written up. The worst thing is that any younger person who is so impertinent as to write out a proof of one of these results has their paper rejected.

**Paul Taylor**                                    10/12/09
[..]  I asked exactly the people who should have
written it whether there was an introduction to [some
subfield of CT] for analysts.  There isn't, so I had
to write my own.  In this, I stated without proof
[some folk theorem].  The referee quite reasonably
asked for a reference to a proof, but, so far as I
can gather, no such proof exists in the literature.

**Paul Taylor**                                              10/12/09

```
Each of us can help to leak this secret by doing two
things:
PUBLISH (= make freely available on the Web) all of
the papers that you PRIVATISED by handing them over
to commercial journals.
WRITE textbook or encyclopedia accounts of your work
for resources like the ''n-cat lab''.
```

Immediate effect:

**André Joyal**                                      10/12/09
You are completely right. I have my share of
responsibilities here. I will not try to explain
what happened, because it may be counterproductive.
I apologise to you and to everyone who may have
suffered from not getting access to the information
they wanted from me. I am planning to correct the
problem by publishing all my ''secret'' notes, papers
and books during 2010, starting this December.

# Is it secret? Yes!

**Jim Stasheff**                                                      12/12/09
[a cause for dislike of CT is] the high density of
new vocabulary in many research papers.

**Jim Stasheff**                                                      20/12/09
[.. a solution is] 'thinking categorically' and not
necessarily writing in that dialect.

# Is it secret? Yes, by naturality.

**Zinovy Diskin** 12/12/09

```
It may be just in ''the nature of things'' when a
community A provides abstract models for community B.
Something similar appears in relations between
physicists and mathematicians, or between
physicists/computer scientists and engineers.
[..]
In a typical good case, the reaction would be like
Manin recently formulated in his interview ''we
always knew that but thank you for [your]
attention''.  In a bad case, ...  you know.
```

# Is it secret? Should we care?

**Dusko Pavlovic**                                      14/12/09

I am wondering why is the public image of category
theory so important for us.
I mean, if category theory is a powerful and useful
tool, as it is, then it should be able to take care
for itself.  Bread does not need advertising.
[..]
I do understand that we need to take care for the
public image of our work.  Funding depends on that,
hiring depends on that.  But maybe we should clearly
state that this is a matter of advocacy and of
influence, and not mix it up with Promoting the
Truth.  I somehow think that the truth can take care
for itself.

# Is it secret? Should we care?

**Zinovy Diskin** 25/12/09

Suppose that once upon a time there were two classes
of people, say, A and B, with different logics and
aesthetics and criteria of elegance.
Correspondingly, they had developed different
mathematics, MA and MB. It so happened that
A-aesthetics and thinking based on it turned out to
be inadequate for the reality, and people A were
eaten by saber-toothed tigers. Mathematics MA was
forgotten and its traces can now be found in ancient
archives only. I'm afraid that the A-destiny is
awaiting the opponents of cat theory and their
non-categorical math. :)

# [My] Conclusions

- CT has come a long way.
- Its potential is still unrealised in full.
- Make your results available and accessible: today and in the future.