The Open Science Interviews by Kaja Scheliga

Interview with Carolina Ödman-Govender, Berlin, May 2013

KS: So, to start off, if you could quickly introduce yourself, who are you? And what do you do?

CG: Okay, I am Carolina Ödman-Govender, I am an astrophysicist, and I live in Cape Town, South Africa which is a beautiful country and a great place to do astronomy. (…)

KS: Thank you. So, how do you think the internet changed the way science is done?

CG: Tremendously. First thing, the internet is a place where you can share your research. Nobody goes and reads a scientific paper in a journal anymore. You just download the preprint, or read the paper online. Everything is online. The great thing with that is that you can also mine the literature much more easily, because it is searchable, right? Anything properly digitised is searchable, so that is great. Having access to data and to codes is extremely important. In most academic disciplines that I can think of there is still a bit of reluctance to share codes. Because to some codes are a bit of a currency; you are the specialist in this particular very narrow thing and you have your code and that is the only code that does that the best, but at the same time, I think eventually sharing code will be inevitable. There is some reluctance also because if you share code you do not necessarily get citations for code and citations are the currency to get jobs. It is a conversation that is permanently ongoing in astronomy and one of the most active places where this conversation takes place is actually the astronomers' Facebook group, would you believe it. Yes, so there is a very active group on Facebook. It is a closed group, so you have to be a professional astronomer, and you discuss career things, and papers and discoveries and things like that, it is kind of funny.

KS: What is it like for sharing data?

CG: So, data tends to come in vast quantities. And often a system that is in place is that when you have a big telescope, or a space telescope for example that generates a lot of data, the data is proprietary to the team for a while and it is sort of embargoed for internal publication so you try to get the most of it. And then you release it to the public, I mean to the rest of the community who then, you know, include it in their research and so on. And that seems to be a recipe that seems to be working, because the people who get the data first are the people who worked on getting the grants to build the instruments. So there is a lot of work that went into that and it is a way of ensuring that they get the first publications out of the data. Yes, so currently it seems to be working. I would like to see everything get more open, but we will get there.

KS: So talking about openness, what do you think of when you hear the term open science? What is open science for you?

CG: To me open science is sharing much more than just data and the code, it is also sharing thinking. So in astronomy we do not really have lab books, but we have conversations. When we hit a problem we have a conversation. So being able to share the process of how we get to the results we get and I think it is a very good thing. And eventually, I mean you risk information overload, you do not want to hear every astronomer's coffee room conversation for every small problem, you do not want to do that. But where I think it can help is that it can put negative results out into the community, so that if you find something that is a non-result, obviously you are not going to get a publication out of it, and a lot of people say: oh, okay, they discard it and they go and search for more results. Which means that a lot of people end up duplicating things, because at the beginning it sounds like a good idea, right? And so a lot of people will have the same good idea and realise: oh no, that is actually not a result. So if we could get the non-result out it would help, I think, to not reinvent the wheel in different parts of the community, in different universities, different groups doing the same thing and finding non-results, negative results.

KS: But do people in your field actually do that, publish non-results or publish negative data? Or are they rather scared: it might damage my reputation because I did some research and nothing came out of it.

CG: No, I do not think people are scared for reputation. I think it is more, taking a result and turning it into something that you can publish is quite a lot of work, formatting, writing, making sure everything is right and so on, so there is a lot of editing work that goes into that, so if you have a negative results, taking that extra amount of work when you can actually go and look at something else, takes priority I think. So that is probably why people do not do it.

KS: Do you see any limits to openness in science?

CG: In astronomy I do not think so. I think there are other disciplines of science that are more controversial, maybe pharmacology, you do not want to necessarily give general public the means of making crazy drugs and that kind of stuff. I do not know, it is not my area. But I think in astronomy we are quite lucky because we have a science that does not have to have much conscience, because we are just looking at whatever the universe is willing to show us. And yes, cool, we are creating really cool technology and so on, but we are not producing something that mingles with nature, and so we are kind of safe in that sense. So I think for astronomy I do not see any hard limits that should be enforced, but then again maybe it is just naive, I do not know.

KS: So where does openness in astronomy take place?

CG: Well astronomy is traditionally quite an open science. I mean people are quite open about it, and very happy to share, discuss results and things like that. So it takes place in sharing articles, often people put their articles on a preprint server, it is called ArXiv server, before they are actually published in journals, as long as the journals are okay with it.

KS: And it is quite common practice in astronomy, right?

CG: Oh yes, completely common practice. So, that is one way. Also in conferences and workshops, people are quite open, the way they discuss their research and results and how they find things and how they work things out. So I think in general, it is not a science where people try to hide stuff. And that is good, I mean it is a nice atmosphere.

KS: Great. You do quite a lot that involves citizen science. What citizen science projects do you do?

(…)

CG: Well, let me think, I mean my closest collaborators are all the people working right in the heart of citizen science projects. I am more on the outskirts, I bring the citizen science projects to the public, for example into the schools and so on. Especially in South Africa where there is a lot that can be gained from those things and not a very high awareness of the opportunities of citizen science. So other than this thing I cannot talk about, I am not actually developing any citizen science projects currently.

KS: But the citizen science projects that you mentioned in your talk / or the ones that come to your mind where you are not involved in, the most important ones in your field…

CG: I think the very big ones that are changing the game are, well, it started with Galaxy Zoo and that has become the Zooniverse, and that is the brainpower based citizen science project where people have to use their brains, not just idle computer time to actually look at things. And a very interesting aspect of that is that you use and benefit from the wisdom of the crowd, which is this fact that if you take a crowd and you throw a problem at them then the likelihood is that if it is average people the result will be cleverer than one genius. (…) And it is very interesting, because in astronomy citizen science, it really works like that. For example if you classify galaxies, that is a spiral, this is not a spiral and you compare what they look like, you take the same image and you give it to lots of different people, so the same image gets classified a lot of times and that is the best way to ensure that the result is actually correct, because if one person can make a mistake then the mistake can be overruled by the majority who get it right. It could be a professional astronomer as well as a citizen scientist making a mistake. The best way to ensure that you get the right result is to get the data seen by new eyes over and over again.

KS: So how do you see the relationship between citizen science and “traditional science”?

CG: Well, would you call “traditional science” is carried out by people who have a degree in the field, a specialization, they go through the academic pipeline, whereas citizen science is also real science, producing real scientific results, but where a lot of the work is done by the citizens. And it is also recognition that the academic pipeline is great to gain the specialisation and the insight and the knowledge, the very specific knowledge, specialised knowledge, but some tasks you do not need that knowledge for. And I mean we might as well go the citizen science route because if you are going to waste somebody who has spent twenty years becoming a specialist on something, doing something that everybody else could do and would enjoy doing, ultimately it is kind of a waste of time, right?

KS: Which tools do you use for your own research?

CG: Well, I would say mostly, well thank God we are not sticking to very specialist computer languages nowadays, so now the stuff will be Python and that kind of stuff and more and more we are trying to use web technologies as well, so I showed an example of a data visualisation and actually data fitting, using JavaScript, because all those languages are so powerful nowadays. You do not necessarily need to write a very complex code in Fortran, compile it and it only works on your machine and then you run it and you have to wait a long time to get the results, no no. Now it is much more instantaneous, much more interactive and as I said much more easy to share with other people as well, so yes, I would like to see more and more web tools used in research. Yes.

KS: And how about sharing ideas with your colleagues, or work in progress? Do you use any tools for that?

CG: Well yes, GitHub to share codes for example, that is a very good place, otherwise there are these online collaborative platforms, I’m thinking of the Trellos and the Google Plus communities and all those things. They are all useful, and the great thing about that is that, scientific collaborations happen internationally, your collaborator on one project is on the other side of the planet, that is super common in astronomy. And so, when you use those things, the conversation you have gets recorded, and you can follow it, you can remember the conversations you had with your colleagues just because you have a Google plus community where you had these conversations. So a lot of online collaboration tools end up being used, a lot of projects use wikis for example and that kind of stuff. So yes.

KS: And how about when you write together with your colleagues? How do you do that?

CG: Email. Yes there is still a lot of email going around.

KS: Okay. Even when you work on a text?

CG: No, when we work on a paper we use LaTeX. So, because it makes just beautiful mathematical symbols and everything. Microsoft Word sometimes, but I mean that would be for conference proceedings if the conference organisers really enforce it, but as astronomers, we do not really, we prefer using LaTeX, yes.

KS: Okay. You said that you collaborate internationally, so do your projects really cross boundaries? Does physical presence make a difference, or does the internet connect people in such a way that it does not really make a difference where your colleagues live, and in what time zone they are and if there is a border in between you or not.

CG: Well we use the traditional, email and teleconferencing as well and that kind of stuff and then you have to juggle time zones and things. If you are out observing you are awake during the night and sleep during the day. But astronomy is a great job because it makes you travel round the world. At conferences there is a lot that happens in terms of face-to-face meetings and you make a lot of progress at conferences. And otherwise working visits are quite common, yes, so there is a lot of travelling involved in astronomy, and that is one of the attractions of the job actually, for young people.

KS: And having done that for a while, do you still enjoy that?

CG: Travelling? Oh yes.

KS: Okay. You said something very interesting in your talk, that when we talk about crowdsourced projects we have to take the whole crowd into account. And with the work you do, I think you are really facing this problem of the crowd and people who maybe are not that privileged but you still do try to take them on board. So, do you find that the internet can actually help to cross this border, or is there still this digital divide that we have to try to overcome?

CG: Well, the digital divide is very present, if we are talking about taking the whole crowd on board, we have to go to places where the internet is not a given. And in those places most people access the internet from cell phones, if they access the internet, not from computers or tablets. And so you have to think a little bit differently. Instead of thinking, oh yes, big images no problem, we have fast internet, you have to be a bit smart. You have to be a bit clever in how you digest stuff for the internet, because if it is consumed on a cell phone, on a feature phone with WAP, it is not the same as on an iPad with a cool interactive interface and things. So you have to give it a bit of thinking. But as astronomers we are problem solvers, right? So, let's just take that problem and think about it and see how we can go about it and on a case-by-case basis we end up having these great projects were it actually works and it makes a difference. And you know maybe we will find a solution that works in lots of different places eventually, but we have to go and reach out to the people who do not have the internet and try

to bring them on board and say this astronomy, this is what we do and it is also yours, because astronomy is for everyone.

KS: And education probably plays a big role as well, right? You have the 'earthball' here, you teach people, you teach kids how to code, so that is part of it as well, right?

CG: Yes exactly. Absolutely.

KS: Anything you want to add, anything you want to say that I did not ask you about?

CG: Let me see, about open science, not that I can think of right now.

KS: OK, great. Thank you so much.

CG: No, it's a pleasure.

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* This interview was conducted as part of my research at the Humboldt Institute for Internet and Society. The interview was recorded and transcribed. The transcription was carried out with the best intentions of accuracy but can nevertheless contain unintended mistakes. This version of the interview has been slightly edited for better readability without any substantial changes to the content.

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