

or the event itself and why they are attending. That helps nervous attendees to avoid blurting out something awkward that will turn off a potential employer, he says.

At the event, researchers should relax and talk to whomever feels most approachable. Successful networkers know that any contact could prove valuable, so attendees should keep an open mind. At the Gordon Conference, Hall spoke to scientists at pharmaceutical companies even though he was not explicitly looking for a job in that sector. Jason Kreisberg, a microbiologist turned freelance science editor based in San Diego, California, gained his current biotechnology client through contacts with an investment adviser to whom he had casually spoken at an alumni event.

Listening is as important as talking. Researchers should pay attention to the professional aims and needs of the people they talk to, says Kamens, because the best way to build a relationship is to offer help. Such offers might entail e-mailing a research manuscript or simply introducing the contact to a colleague — and they provide an excuse to reconnect online. The personal connection encourages the contact to return the favour as soon as an opportunity arises.

Many early-career scientists experience a plunge in self-confidence at least once

“Networking is not done well if you come across as a networker.”

while networking. Perhaps someone abruptly excuses themselves from the conversation out of apparent

boredom, or a desired contact seems unapproachable. The best way to handle these negative emotions is to realize that they are normal, and to let them pass. Later, consider what might have gone wrong. Weiser says that attending networking events taught her about the cultural differences between New Yorkers and residents of her native Israel. In Israel, she says, it is common to interject one’s thoughts mid-conversation, but in New York, she has found that this habit turns some people off. “I’ve had to learn to be less aggressive in conversations, and to not interrupt people,” she says, adding that these adjustments have been worth the effort, and her talks with new colleagues are now more fluid.

“The worst that happens is that you leave the event feeling like you didn’t present yourself well,” says Kreisberg. “So you drive home and think about how to work on your elevator pitch or how to better explain your goals,” he says. “For me, the best motivation is to fail a couple of times, and then you realize, ‘Okay, I can get better at this.’” ■

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COLUMN

Music meets science

Successful musical composition and scientific research share important traits, argues **Stephane Detournay**.

What do Paul McCartney and Stephen Hawking have in common? One is recognized as one of the most successful composers and recording artists of all time; the other is a world-acclaimed theoretical physicist and a pioneer in uncovering the mysteries of the Universe. But both infused their respective fields with creativity.

The relationship between science, music and the arts has been demonstrated in various contexts. In the 1979 book *Gödel, Escher, Bach* (Basic Books), for example, author Douglas Hofstadter used the exploits of mathematician Kurt Gödel, artist Maurits Cornelis Escher and composer Johann Sebastian Bach to illustrate the cognitive underpinnings that their fields have in common.

Less well documented is the idea that scientific research and musical composition share a number of essential stepping stones. One might loosely classify them into four steps: onset, development, refinement and exposition.

Ideas start germinating in many ways. Scientific collaborators often engage in ‘jamming’, for example, when they interact to decide on a structured way to answer a question. Sometimes researchers notice connections across fields, realizing that a given question has been answered using a certain technique, and that a similar approach can be exploited to tackle another problem — something like introducing a string octet or a sitar into a Beatles song. Or a scientist might just think hard about how to achieve a particular objective. ‘A-ha’ moments can happen anywhere, at any time: while attending a conference, standing at a concert, or watching a captivating movie or a boring talk. The same is true in music: McCartney said that the 1965 song ‘Yesterday’, one of the greatest hits of all time, came to him in a dream and that he himself could not believe that he had composed it.

After the early excitement of a new idea comes the next phase: development. Then, once a nebulous idea has been honed and better defined, it is time for practical implementation. Both scientists and musicians can work alone, or embark on a collaboration. Hawking’s work with mathematician Roger Penrose led the pair to conclude that the Universe began as a singularity. McCartney’s contribution to The Beatles is hard to disentangle from John Lennon’s. But both Hawking and McCartney also have long track records of brilliant solo contributions.



NIHAT DURSUN/GETTY

Refinement is the last part of a project. You know that you have some nice results and that the work has potential, yet it has to be presented and rendered accurately. This phase can sometimes be frustrating. The song has been written, but still needs recording; computations work, but must be submitted to a journal for review. Musicians can spend hours on detailed clean-up in the same way that scientists might repeatedly review their arguments to weed out weak points, eradicate misplaced assumptions or identify overlooked data.

Once the songs are released and the papers are published, there is the last phase: exposition. How will people judge your work? Papers will be read and songs listened to by a varied audience: scientists will give talks and musicians will perform at concerts. A community will perhaps slowly start to form an opinion on the materials you obsessed over for weeks, months or years. You might feel great pride or satisfaction — or you might become disillusioned.

Some musicians will be lucky enough to land a recording contract and find success; some scientists will earn an academic post or tenure. For the rest, there is always the option of instilling Hawking’s dream — to spread into space and reach out to the stars, across the Universe — into their career pursuits. Many will search out alternative scenarios and then find the means to uncover their own professional niche — a cross-disciplinary, cross-genre space in which few have dared to jam before. ■

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