



## 专访德米特里·布德克教授： 如何打造一个成功的国际学术会议报告

德米特里·布德克 (Dmitry Budker) 出生于前苏联。1980 年至 1985 年就读于新西伯利亚国立大学，并以优异成绩获得物理学文凭。之后，他在苏联核物理研究所担任初级研究员，研究原子激光光谱。1993 年，他获得加利福尼亚大学伯克利分校物理学博士学位，并在该校担任博士后研究员，后于 1995 年获得教职。2014 年以来，德米特里·布德克领导着德国美因茨亥姆霍兹研究所的物质与反物质部门。他的研究重点是在原子、分子和光学物理中测试自然界的基本对称性，以及开发磁共振和量子传感的新方法和应用。2021 年，他获得了诺曼·F·拉姆齐原子、分子和光学物理以及基本定律和对称性精确测试奖，同年与同事分享了亥姆霍兹协会埃尔温 - 薛定谔奖。

**Yuzhe Zhang:** Professor Budker, thank you for joining me today. Before we continue to the our main topic, I actually have a question about your Chinese name, 柯建国. How did you get this name?

**Dmitry Budker:** Thank you for having me. I have travelled to China many times. I have gained a lot on these trips: good friends, long-term collaborators, and even a Chinese name, 柯建国. The given name, meaning something like "builder of the nation", was a gift from a friend during my visit to China in 2013. I do like the "builder" meaning. My friends and I considered "Bu" as my family name, but it sounds negative in Chinese so we chose "Ke" in the end.

**Yuzhe Zhang:** Very glad to know you spent good times in China! I hope you have more good memories of China in the future. Let's now move on to the topic of today's interview: scientific viewgraphs. In an oral scientific presentation, one usually uses viewgraphs as visual aids.

**张宇哲:** 布德克教授，感谢您接受我的采访。在我们进入正题之前，我有一个小问题。您有一个很有特色的中文名“柯建国”。这个名字是怎么来的？

**Dmitry Budker:** 谢谢你们的采访邀请。我去过中国很多次，结识了很多好朋友，还有科研上的合作伙伴，甚至还收获了“柯建国”这个名字。“建国”这个名字，是我 2013 年访问中国时一位朋友送给我的礼物。这个名字的意思是“国家的建设者”，我很喜欢其中“建设者”的意思。我和朋友曾考虑过用 Budker 中的 Bu(布)作为我的姓氏，但它在中文里听起来有些消极，所以我们最终选择了 Ke(柯)。

**张宇哲:** 很高兴知道您在中国有这么多收获！希望您今后能有更多收获。下面让我们进入今天访谈的主题：科研报告中的幻灯片。做口头报告的时候，大家常用幻灯片作为辅助。根据您的经验，好的幻灯片是什么样的？您是否经常看到准备得不好的幻灯片？

In your experience, what makes them truly effective? Do you often find poorly prepared viewgraphs?

**Dmitry Budker:** I witnessed many scientific presentations where the message was lost due to poorly designed visual aids. One sign of an unsuccessful presentation is that the speaker usually receives very few questions. This shows that the precious opportunity for the speaker to communicate with the audience is wasted, along with everyone's time. On the other hand, a successful presentation can really excite the audience, and even change someone's life. In our discussion today, I would like to suggest a few simple, common-sense guidelines to help researchers present their ideas effectively and avoid common mistakes. Unfortunately, such mistakes are often committed by novices and experienced scientists alike.

**Yuzhe Zhang:** What would be the first thing to do when preparing scientific viewgraphs?

**Dmitry Budker:** It would be to know your audience. The gaps between different scientific communities are huge, and your audience are usually less familiar with your work than you might expect. Moreover, the speakers usually have worked on the topic of presentation recently, but the audience, for the most part, have not. This is also the reason that the presentation should always start with an introduction.

**Yuzhe Zhang:** What are the common mistakes made in viewgraphs?

**Dmitry Budker:** High density of information, as an example. There are two aspects here: the overall number of viewgraphs and the information density on an individual viewgraph. On one hand, high overall information density results in the speaker not being able to finish the talk on time. On the other hand, if the audience see a high-density viewgraph, like "a wall of text", they often perceive it as such and are not able to absorb the written information.

**Dmitry Budker:** 我见过很多失败的报告，其中幻灯片里不当的视觉设计导致听众听不懂报告。失败的一个标志是听众提问很少，这表明报告人错失了与听众交流的宝贵机会，浪费了双方的时间。一个成功的报告则可以激发听众的热情，甚至改变某个人的一生。遗憾的是，无论是初出茅庐还是经验丰富的科研人，都经常犯错。我想给大家一些简单、常识性的建议，帮助大家有效地做报告，避免低级错误。

**张宇哲:** 准备幻灯片时首先要做什么？

**Dmitry Budker:** 首先要了解你的听众。不同学科方向之间的差异很大，听众通常没有你想象中那么了解你的工作。此外，报告内容往往是报告人近期的工作，报告人当然熟悉，但听众会觉得陌生。所以，报告一定要从引言开始。

**张宇哲:** 幻灯片中常见的错误有哪些？

**Dmitry Budker:** 比如信息密度过高。这里我讲的信息密度分整体和局部两个方面。一方面，如果整体信息密度过高，报告就无法按时结束；另一方面，如果单张幻灯片上密度过高，做成了排山倒海的“文字墙”，听众往往会失去兴趣，不再吸收其中的信息。



Budker 组部分成员在一场学术会议上为 Dmitry Budker（前排左三）庆祝生日

**Yuzhe Zhang:** May you give your solutions on information density control?

**Dmitry Budker:** The general rule is to stick to the big picture and keep minimal detail. You can construct your big picture by a few key questions: Who? (did the work); Why? (the motivation); How? (the method); What? (the results); and importantly, Who cares? (the significance of the work). In terms of individual viewgraphs, a good one has one minimal-detail diagram or plot and some brief text of two to four lines. For most speakers, properly presenting such a viewgraph takes 1-2 minutes. For instance, if you have a 12 min talk at an American Physical Society (APS) meeting, you will only be able to show half a dozen slides. Time management seems easy, but unfortunately, I witnessed many people failing to finish their talks on time.

Aside from the general rule, there are tricks to control the density in individual viewgraphs. You can move details in the viewgraphs to "back-up slides", in case you are asked about them. Another trick is to use "bullet text". To minimize the amount of text, it is a good idea to omit articles, periods at the end of a bullet, and unnecessary modifiers in the bullet text, because you need the audience to focus on your speech instead of reading the text.

Interestingly, some successful speakers advocate the use of graphic tools such as pie charts and relationship trees instead of bullets. See what works best for you!

**Yuzhe Zhang:** Those are very good solutions. May you teach us more tricks for making viewgraphs?

**Dmitry Budker:** Of course. When making viewgraphs, you should minimize the use of equations. The folklore is that with each equation used, one loses half the audience. If the use of equations is unavoidable, make sure that every symbol in the equation is defined, and try to discuss the equation part by part. In contrast to text and equations, graphics, including figures, plots, pictures and diagrams are always favored by the audience. You

**张宇哲:** 您会如何控制信息密度呢?

**Dmitry Budker:** 总的原则是注重大局(big picture), 精简细节。你可以通过几个关键点来构建你的大局观: 谁(做的工作); 为什么(动机); 怎么做的(方法); 得到什么(结果); 以及很重要的, 谁在乎(意义)。就单张幻灯片而言, 它需要一张简洁的图片, 以及两到四行文字。大多数报告人讲好一张这样的幻灯片需要 1 到 2 分钟。举个例子, 如果你要在美国物理学会(APS)会议上做 12 分钟的报告, 那么就只能展示 6 张幻灯片。时间管理看似简单, 但现实中超时的人我见过太多了。

除了总的原则, 我还有一些控制单张幻灯片信息密度的技巧。你可以将细节信息移到“备用幻灯片”中, 供听众提问时用。另一个技巧是将文本列成条目, 举要删芜。尽量减少文字量, 最好省略冠词、句号以及不必要的修饰语, 不需要写成完整的句子, 因为你需要听众把注意力集中在你的演讲上, 而不是让他们默念文本。

话说回来, 一些优秀的报告人主张使用饼图和关系树等图形工具来代替文本。可以都试试看, 适合你的就是最好的!

**张宇哲:** 这些办法看起来都很实用。您能再教我们一些技巧吗?

**Dmitry Budker:** 当然可以。幻灯片上应尽量少写公式。大约有这么个定律: 每使用一个公式, 你就会失去一半的听众。如果不得不用公式, 就要给公式中的每个符号标注定义, 并且要一点一点讲清楚公式的每一部分。与文字和公式相比, 图片总能受到听众的青睐。你可以试试在每张幻灯片中都放一张图片。用图片来讲公式说不定能把失去的一半听众拉回来。此外, 可以使用动画, 用动起来的箭头等符号来显示逻辑关系。任何移动的东西都会吸引听众的全部注意力。动画的威力很强大, 但你必须谨慎使用, 因为它也可能分散听众的注意力。



can try to use a graphic on every viewgraph. A figure to illustrate your unavoidable equation may pull your audience back. In addition, the use of animated arrows and other symbols is encouraged to show logical relationships. Anything that moves on a viewgraph tends to draw full attention of the audience. While animation could be a powerful presentation aid, one has to use it with caution as it can also be distracting.

There are some minor points which are often neglected but are essential to consider. First, you should be compassionate. It is advisable to use large fonts for the text, avoid small details in graphics and use a high-contrast color scheme, because some in the audience may have peculiar color perception, which happens to be the case also for me. Additionally, page numbers should be displayed on every slide. This makes it easier for the audience to ask questions at the end. Furthermore, it is crucial to include the sources of references on the same viewgraph where you quote them. You really do not want to upset the authors of those papers who came to listen to you. Lastly, when it comes to graphics and images, one should also worry about the copyright issues—it is the law!

**Yuzhe Zhang:** Thanks for sharing these many points! Does a good presentation always take a lot of effort to prepare?

**Dmitry Budker:** Not necessarily. Good viewgraphs do not have to be fancy, and may not take too much time to make. Following the rules above would likely result in decent viewgraphs. However, good viewgraphs are only one of the elements of success. Practicing a presentation is really helpful! But do not overdo it—a bit of improvisation could better connect you with the audience, while a presentation that is too "smooth" could leave your audience little space to breathe or think.

还有一些小问题经常被忽视,但你必须要考虑。首先,要换位思考,想想看观众眼中的幻灯片是什么样。建议使用大字号,删去图片中的小细节;使用高对比度的配色方案,因为有些人分辨颜色的能力并不好,我恰好就是这种情况。每张幻灯片上都应显示页码,这样便于听众在报告结束后提问。此外,如果某张幻灯片上引用了他人的成果,那么就要在同一张幻灯片上注明出处——万一原作者就在讲台下呢?最后,如果使用了非自制的图像,还应该考虑版权问题,这是法律规定的!



Dmitry Budker 与他的学生和合作者

(左一 北京大学电子学院赵一心博士,左二 本文特邀通讯员张宇哲博士,左三 中国科学院物理研究所郑慧婕副研究员,右一 北京大学于东睿博士,右二 北京大学吴腾研究员,右三 Dmitry Budker 教授)

**张宇哲:** 谢谢您分享了这么多要点。那么,一个好的报告是否总是需要花费很多精力准备?

**Dmitry Budker:** 不一定。好的幻灯片不一定要花哨,也不一定要花太多时间来制作。如果能遵循上面提到的规则,那么大概就很好了。不过,好的幻灯片只是成功的一部分。熟能生巧,练习报告很重要!但也不要练得太熟练。一点点即兴的成分可以更好地吸引听众,而过于流畅平滑的报告则会让听众喘不过气来。

**张宇哲:** 非常感谢您的建议!



### 特邀通讯员: 张宇哲

2020 年获中国科学技术大学物理学士; 2022 年获美国茨约翰内斯·古腾堡大学物理学硕士, 现攻读物理学博士, 参与宇宙轴子自旋进动实验等研究工作。《计测技术》特邀通讯员。