Ladies and gentlemen of the jury, good day to all. My name is Jin Shuyi, representing the LithoSpark team. Our project is titled LithoSpark—the global frontrunner in lithium battery supervision sensors and intelligent algorithms.

I would like to begin by sharing the genesis and intentions of our team. During our studies at the University of Glasgow, we elected to take a course taught by Dr. Duncan on microelectronic systems. This greatly sparked our interest in innovative microsystems and led us to join his research team, which focuses on novel sensor technology for lithium battery safety. After returning to China, we established a company in Chengdu.

Our in-depth investigation shows that lithium batteries, being the most widely used form of clean energy, are a focal point for government policy support worldwide. However, over 63,000 lithium battery explosion incidents occurred globally in 2022. This safety concern has necessitated an expansion of the lithium battery safety monitoring market, projected to surpass 2.5 billion dollars by 2027.

Lithium battery explosions typically result from excessive pressure, high temperatures, or electromagnetic interference. However, current market sensors suffer from three major pain points: limited monitoring indicators, inaccuracy, and difficulty in early warning. Most sensors only monitor a single indicator, while few multi-parameter sensors are impractical due to high costs and large size; additionally, these sensors have significant delays and excessively low responsiveness, making it difficult to perform real-time monitoring. Moreover, there is a lack of suitable data processing algorithms for early risk detection. To address these challenges, the LithoSpark team from the University of Glasgow has proposed multi-field coupled sensors and advanced warning algorithms.

Comprising members from China, the US, and the UK, our team utilized Glasgow’s microelectronics lab resources to create our sensor product. However, the journey towards our final success has not been smooth sailing. Our initial attempts with several conventional sensor architectures encountered challenges when it came to the integration within battery packs. Later on, inspired by the information transmission mechanism in the biological nervous system, we adopted a distributed transmission structure. However, after hundreds of trials with various organic materials, we still haven’t a suitable material. Faced with this research impasse, Dr. Duncan introduced us to Professor Xiang Yong, who helped us select a cost-effective and sensitive material, PVDF-TrFE. Through numerous experiments, we successfully developed our multi-field lithium battery sensor.

Technically, we've tackled the pain points in current market from two aspects: hardware and software. For hardware, unlike traditional sensors, our multi-field coupled sensor technology enables a ternary integrated monitor of pressure, temperature and magneto-electricity. We adopted a distributed transmission structure based on the PVDF material, successfully obtaining a 91.6% improvement in measurement accuracy and a response time of merely 0.62 milliseconds. On the software side, in collaboration with the University of Glasgow’s computing lab, we proposed the M-THERM system. Our product's performance in early warning time is five times better than traditional products, reaching 100 hours in advance.

During the product development process, we have garnered recognition from multiple fronts. To date, our technology has secured 13 patent grants and 3 software copyrights, with all patents held by core members of our team. In addition, we have published 5 high-level academic papers, including those in prestigious journals like Nature Communications and other quartile one SCI journals. Furthermore, we are the first company globally to launch multi-field coupled lithium battery sensors into the market, filling a void in this domain.

Currently, our company offers two main products: the smart multi-parameter sensor and the cloud monitoring system. The intelligent sensor, with its lower pricing, higher accuracy, and faster responsiveness, will quickly capture the market share. The cloud monitoring system collects sensor data and provides feedback to users upon anomaly detection, offering online monitoring, risk localization, and remote personalized services, thus attracting more customers and enhancing user retention.

Our innovative products have also received endorsements from Professor Cui Yi, a member of the National Academy of Sciences and the world’s leading material scientist, as well as Professor Muhammad Imran, a Fellow of the Institution of Engineering and Technology. They both believe that our product is at the global forefront, capable of significantly improving battery safety, and therefore, holds significant societal value.

Compared to the currently widely-used lithium battery state-of-charge sensors produced by companies, our product not only offers multiple monitoring indicators but also boasts higher accuracy, lower costs, and faster response times. It’s worth noting that the current pricing is based on sample costs, in future, with mass production, the prices may increase but still remain competitive within the industry.

Regarding our business model, we establish a stable supply of raw materials and equipment by collaborating with companies like Arkema, while simultaneously targeting cutting-edge lithium battery companies, infrastructure battery energy storage companies, and consumer-facing power battery companies to constitute our diverse user base. Our primary revenue source is the hardware sensor product, with additional income from our cloud monitoring system.

At present, our product has completed product trial certifications with several companies and has signed letters of intent for cooperation with Chengdu Weili Energy Co., Ltd. and Sichuan Puli Technology Co., Ltd., with orders amounting to over 1.2 million yuan. While the companies we're collaborating with are not large in scale, they are willing to provide opportunities for our product trials. They have utilized our sensors in their latest lithium battery equipment, observing a significant improvement in monitoring effects. Therefore, they are willing to engage in long-term cooperation with us.

Our financial projections indicate a steady increase in company revenue and net profits, with a predicted third-year income surpassing 36 million and a net profit rate of 18%. We're planning an initial funding round of 8 million, offering 15% equity. The funds raised will primarily be used for small-batch production, technical optimizations, and market development.

In the future, our company will advance research and development, production, and promotion simultaneously. In the first year, we will establish ourselves in Chengdu, breaking into the initial market with our multi-field coupled sensors. The subsequent two years will focus on technology iteration and creating more comprehensive lithium battery sensors, setting sights on the national lithium battery monitoring market. We will then proceed to develop a more intelligent and controllable lithium battery monitoring system to reach global markets.

This is the leader of our team, Xin Yue, who have participated in the Glasgow Leadership Talent Development Program and has made significant contributions to the success of our project through excellent leadership and teamwork. Additionally, our project team consists of eight core members, bringing together interdisciplinary talents, all with outstanding academic achievements and backgrounds.

This project is guided by several renowned scholars, including the famous materials engineering expert Prof. Xiang Yong, low-cost sensor array expert Dr. Duncan Bremner, and Dr. Hadi Heidari, the head of the Computing Laboratory at the University of Glasgow. Moreover, the project benefits from three business advisors who are professors from the world's leading Adam Smith Business School, with extensive experience in the commercialization of scientific and technological achievements.

The University of Glasgow has provided multifaceted support for our team project, offering platforms for international exchange and cooperation, international engineering education, and support for innovative entrepreneurial projects. In gratitude to the university, our team actively promotes the deep integration of industry, education, and research, participating in multiple international conferences and interdisciplinary exchanges.

Additionally, our company has made various contributions to sustainable development.

We will also create job opportunities for the society. Within three years, we aim to achieve over 200 direct employment opportunities and more than 3,000 indirect employment opportunities.

We firmly believe our sensor product will light the path to advanced lithium battery sensing.

评委会的女士们、先生们，大家美好的一天。 我叫金淑仪，代表 LithoSpark 团队。 我们的项目名为 LithoSpark——锂电池监控传感器和智能算法的全球领先者。

我想首先分享我们团队的起源和意图。 在格拉斯哥大学学习期间，我们选择了邓肯博士教授的微电子系统课程。 这极大地激发了我们对创新微系统的兴趣，并促使我们加入他的研究团队，该团队专注于锂电池安全的新型传感器技术。 回国后，我们在成都成立了公司。

我们的深入调查显示，锂电池作为应用最广泛的清洁能源，是全球政府政策支持的重点。 然而，2022年全球发生超过63,000起锂电池爆炸事件。这种安全担忧使得锂电池安全监控市场的扩大成为必要，预计到2027年将超过25亿美元。

锂电池爆炸通常是由过压、高温或电磁干扰引起的。 然而，目前市场传感器存在三大痛点：监测指标有限、不准确、预警困难。 大多数传感器仅监测单一指标，而少数多参数传感器由于成本高、尺寸大而不切实际； 此外，这些传感器存在明显的延迟和响应能力过低，难以进行实时监控。 此外，缺乏合适的数据处理算法来进行早期风险检测。 为了应对这些挑战，格拉斯哥大学的 LithoSpark 团队提出了多场耦合传感器和先进的预警算法。

我们的团队由来自中国、美国和英国的成员组成，利用格拉斯哥的微电子实验室资源来创建我们的传感器产品。 然而，我们走向最终成功的旅程并非一帆风顺。 我们对几种传统传感器架构的初步尝试在电池组内集成方面遇到了挑战。 后来受到生物神经系统信息传输机制的启发，我们采用了分布式传输结构。 然而，在对各种有机材料进行了数百次试验之后，我们仍然没有合适的材料。 面对这种研究僵局，Duncan博士向我们介绍了向勇教授，他帮助我们选择了一种经济高效且敏感的材料PVDF-TrFE。 经过大量的实验，我们成功开发了多领域锂电池传感器。

从技术上来说，我们从硬件和软件两个方面解决了当前市场的痛点。 对于硬件，与传统传感器不同，我们的多场耦合传感器技术可以实现压力、温度和磁电的三元集成监测。 我们采用了基于PVDF材料的分布式传输结构，成功地将测量精度提高了91.6%，响应时间仅为0.62毫秒。 在软件方面，我们与格拉斯哥大学计算实验室合作，提出了M-THERM系统。 我们的产品预警时间性能是传统产品的五倍，达到提前100小时。

在产品开发过程中，我们获得了多方面的认可。 截至目前，我们的技术已获得13项专利授权和3项软件著作权，所有专利均由团队核心成员持有。 此外，我们还发表了5篇高水平学术论文，其中包括Nature Communications等权威期刊和其他SCI四分之一期刊。 此外，我们是全球第一家向市场推出多场耦合锂电池传感器的公司，填补了该领域的空白。

目前，我公司提供两大主要产品：智能多参数传感器和云监控系统。 智能传感器以其更低的价格、更高的精度和更快的响应速度，将迅速占领市场份额。 云监控系统收集传感器数据，并在检测到异常情况时向用户反馈，提供在线监控、风险定位和远程个性化服务，从而吸引更多客户并提高用户保留率。

我们的创新产品还得到了美国国家科学院院士、世界领先材料科学家崔毅教授以及英国工程技术学会院士穆罕默德·伊姆兰教授的认可。 他们都认为我们的产品处于全球前沿，能够显着提高电池安全性，因此具有重大的社会价值。

与目前广泛使用的企业生产的锂电池荷电状态传感器相比，我们的产品不仅提供多种监测指标，而且具有更高的精度、更低的成本、更快的响应时间。 值得注意的是，目前的定价是基于样品成本，未来随着量产，价格可能会上涨，但在行业内仍然具有竞争力。

在商业模式上，我们通过与阿科玛等公司合作，建立稳定的原材料和设备供应，同时瞄准尖端锂电池企业、基础设施电池储能企业、面向消费者的动力电池企业，构成多元化的用户 根据。 我们的主要收入来源是硬件传感器产品，另外收入来自我们的云监控系统。

目前，我司产品已完成多家企业的产品试用认证，并与成都威力能源有限公司、四川普力科技有限公司签订了合作意向书，订单金额超过120万元。 虽然我们合作的公司规模不大，但他们愿意为我们的产品试用提供机会。 他们在最新的锂电池设备中使用了我们的传感器，监测效果明显改善。 因此，他们愿意与我们进行长期合作。

我们的财务预测显示公司收入和净利润稳步增长，预计第三年收入将超过3600万，净利润率为18%。 我们计划首轮融资 800 万美元，提供 15% 的股权。 募集资金将主要用于小批量生产、技术优化和市场开发。

未来，我公司将研发、生产、推广同步推进。 第一年，我们将在成都立足，凭借我们的多场耦合传感器打入最初的市场。 后续两年将重点进行技术迭代，打造更全面的锂电池传感器，瞄准全国锂电池监控市场。 随后我们将继续开发更加智能可控的锂电池监控系统，走向全球市场。

这就是我们团队的领导者辛悦，他曾参加过格拉斯哥领导力人才发展计划，通过出色的领导力和团队合作为我们项目的成功做出了重大贡献。 此外，我们的项目团队由八名核心成员组成，汇聚了具有杰出学术成就和背景的跨学科人才。

该项目由多位知名学者指导，包括著名材料工程专家向勇教授、低成本传感器阵列专家Duncan Bremner博士、格拉斯哥大学计算实验室负责人Hadi Heidari博士等。 此外，该项目还受益于三位商业顾问，他们都是来自世界领先的亚当斯密商学院的教授，在科技成果商业化方面拥有丰富的经验。

格拉斯哥大学为我们团队项目提供了多方面的支持，提供国际交流合作平台、国际工程教育、创新创业项目支持。 为感恩学校，我们团队积极推动产学研深度融合，参加多次国际会议和跨学科交流。

此外，我们公司还为可持续发展做出了各种贡献。

我们还将为社会创造就业机会。 三年内，我们的目标是实现直接就业机会超过200个，间接就业机会超过3000个。

我们坚信我们的传感器产品将照亮先进锂电池传感之路。