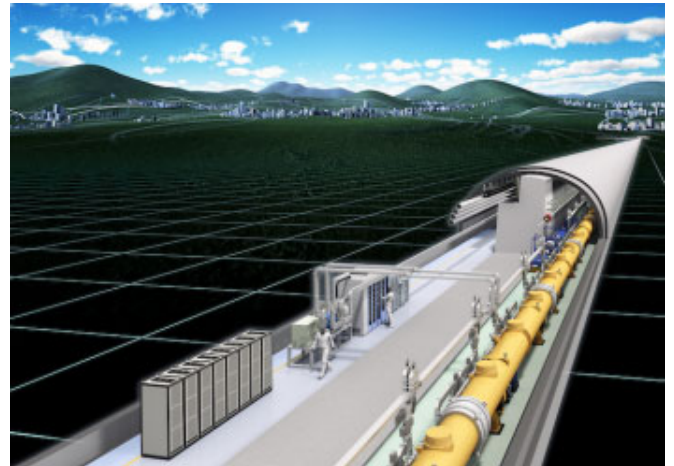


DIRECTOR'S CORNER

ILC Preparatory Laboratory proposal released

by Tatsuya Nakada

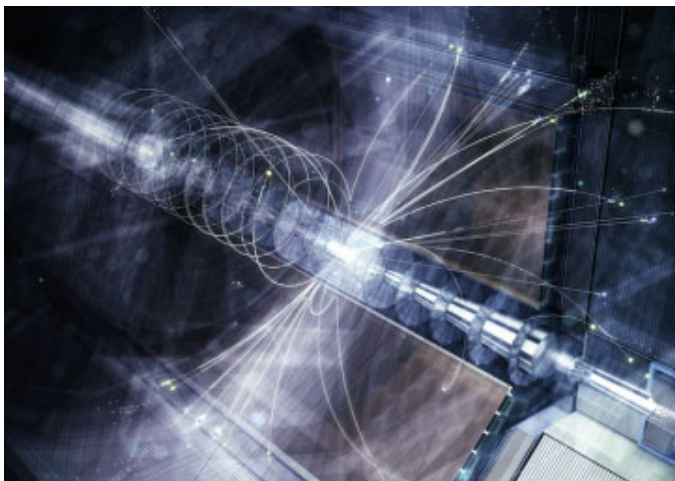
After ten months of work, the ILC International Development Team, mandated to prepare the ILC Preparatory Laboratory, is reaching the first milestone with the release of a proposal which outlines the organisational framework, an implementation model and work plan of the Pre-lab. Many scientists contributed to this effort, showing the great interest of the community in the ILC project. A signal from the Japanese government towards indicating its interest in hosting the ILC and supporting the Pre-lab would now be required for gaining stronger engagement of interested laboratories around the world



ANNOUNCEMENTS

ILCX 2021: Let's discuss about possible experimental opportunities at the ILC

by Hitoshi Murayama



With the growing anticipation that the ILC Pre-lab will be launched in the near future, the serious discussions about all the possible experimental opportunities at the ILC laboratory should be initiated. For this purpose, the ILC International Development Team (IDT) will hold the ILC Workshop on Potential ILC Experiments (ILCX) , from 26 - 29 October, 2021.

AROUND THE WORLD

Accelerating around the globe: big logistics experiment kicks off with Pre-lab phase

by Barbara Warmbein



The devil is in the detail. If a particle physics experiment doesn't work, it's often the low-tech components that cause trouble, not the high-tech ones, because the high-tech ones have been tested to the core. To avoid teething and logistics problems for the ILC, a project called "Cryomodule Global Transfer" will kick off next year.

IN THE NEWS

from *ILC Promotion council*

31 May 2021

[ILC News from Tohoku](#)

Latest news about the local effort for the ILC in Tohoku, Japan. Sign up for subscription

<https://www.facebook.com/tohokuilc/app/100265896690345/>

from *Obserwator Finansowy*

23 May 2021

[Japonii powstaje hybryda miasta i wsi, a dzięki temu regiony rozwijają się mimo postępującej depopulacji.](#)

[Co ciekawe, w prefekturze Iwate być może powstanie Międzynarodowy Zderzacz Liniowy \(ILC, International Linear Collider\). —](#)

[Koszt budowy urządzenia wynosi około 7 mld dolarów, a wokół niego powinno powstać miasteczko naukowe, zamieszkiwane przez około 10 tys. osób personelu. \(Interestingly, the International Linear Collider \(ILC\) may be built in Iwate Prefecture.——The cost of building the device is about \\$ 7 billion, and a science town with a population of about 10,000 people should be built around it. staff people.\)](#)

from *Yomiuri Shimbun*

21 May 2021

[宇宙の謎に迫る国際リニアコライダー 来年に準備研究所設立へ 海外からは物品提供限定](#)

[巨大加速器「国際リニアコライダー」の誘致に向け、高エネルギー加速器研究機構が設立を目指す「ILC準備研究所」の概要が20日、わかった。世界の研究機関が参加する国際的な組織として、18の専門分野ごとに実験装置の製造や品質評価を行う。KEKは2022年に準備研究所を設立し、25年に技術設計を取りまとめる方針だ。\(The outline of the “ILC Preparatory Laboratory”, which KEK aims to establish to attract the giant accelerator “International Linear Collider”, was revealed on the 20th. As an international organization in which research institutes from around the world participate, we manufacture experimental equipment and evaluate quality in each of 18 specialized fields. KEK plans to establish a preparatory research institute in 2022 and coordinate technical design in 2013.\)](#)

from *Iwate Nippo*

21 May 2021

[骨太方針に意義明記を 東北ILC推進協、政府への決議採択](#)

[国際リニアコライダー（ILC）の誘致を目指す東北ILC推進協議会は20日、オンラインで2021年度総会を開いた。ILCの意義を政府の「骨太の方針」に盛り込み、省庁横断プロジェクトとして推進することを政府に求める決議を採択した。\(The Tohoku ILC Promotion Council, which aims to attract the International Linear Collider \(ILC\), held the 2021 general meeting online on 20 May. It adopted a resolution calling on the government to incorporate the significance of the ILC into the government’s “bone-buoying policy” and promote it as a cross-ministerial project.\)](#)

from *新浪财经*

18 May 2021

[日美欧新一代对撞机力争2035年投入运行](#)

[力争以日美欧为中心建设的“国际直线对撞机”（International Linear Collider, ILC）是被期待为新物理理论打开突破口的新一代对撞机。它将重现宇宙诞生时的状态，探索物理学的新理论和宇宙的真面目。日本东北地区的北上山地成为候选建设地，力争2035年前后投入运行。\(The International Linear Collider \(ILC\), which strives to build Japan, the United States and Europe as the center, is a new generation of colliders that is expected to open a breakthrough for new physical theories. It will reproduce the state of the universe when it was born, and explore new theories of physics and the true face of the universe. The Kitakami Mountains in Northeast Japan has become a candidate for construction sites, and strive to put it into operation around 2035.\)](#)

from *Iwate Nippo*

11 May 2021

[最新動向や方針を共有 県がILC推進本部会議](#)

[国際リニアコライダー（ILC）誘致実現に向け県は10日、県庁でILC推進本部会議を開き、国内外の最新動向や今後の取り組み方針を共有した。\(To attract the International Linear Collider \(ILC\), the Iwate prefecture held a meeting of the ILC Promotion Headquarters at the prefectural office on the 10 May to share the latest trends in Japan and overseas and future action policies\)](#)

from *Netky.sk*

10 May 2021

[CERN – vesmír v tuneli vo Švajčiarsku](#)

[Druhou bolo pohoršenie katolíckej cirkvi z označovania Higgsovho bozónu za „Božskú časticu“. Na podobnom kruhovom urýchľovači pracujú už aj v Číne. Japonci sa zas pohrávajú s myšlienkou zostrojenia lineárneho urýchľovača – ILC \(International Linear Collider, teda Medzinárodný lineárny urýchľovač\).\(The second was the outrage of the Catholic Church in calling the Higgs boson a “divine particle.” They are already working on a similar circular accelerator in China. The Japanese are toying with the idea of building a linear accelerator – ILC \(International Linear Collider, ie International Linear Accelerator\).](#)

from *Nikkei*

8 May 2021

[日米欧の次世代加速器計画、素粒子から宇宙の姿探究](#)

[日米欧が中心となって建設を目指す国際リニアコライダー（ILC）は、新しい物理理論への突破口を開くと期待される次世代加速器だ。宇宙が誕生した頃の状態を再現して、物理学の新理論や宇宙の姿を探る。東北地方の北上山地が建設候補地で、2035年ごろの稼働を目指している。\(The International Linear Collider \(ILC\), which Japan, the United States and Europe are aiming to build,](#)

is a next-generation accelerator that is expected to open a breakthrough in new physics theory. Reproduce the state when the universe was born, and explore new theories of physics and the appearance of the universe. The Kitakami Mountains in the Tohoku region is a candidate site for construction, and we are aiming for operation around 2035.)

from Yahoo Finance

6 May 2021

Global Big Science Market Report 2021: Major Advances in Technologies and Products, Ongoing Activities and Information on Organizations and Contractors

The report includes an estimation of the market size and analyses of global market trends, with data from 2019, 2020, and projections of compound annual growth rates (CAGRs) through 2025. (Chapter4 “Global Market for Big Science”)

from SMYE HOLLAND NEWS

29 April 2021

The First International Laboratory Of The Two Infinities Is Born

Particle physics and detectors In this chapter, ILANCE sets out to investigate the properties of the Higgs boson with the support of the ATLAS experiment, one of the seven particle detectors built on the Large Hadron Collider (LHC), and the International Linear Collider (ILC), an electron-positron linear accelerator.

from Iwate Nippo

28 April 2021

一関市、取得で大筋合意 NEC事業所跡地、ILC施設活用へ

一関市とNECプラットフォームズ（東京、福田公彦社長）は、同市柄貝（からかい）の同社一関事業所跡地を市が取得することで大筋合意した。課題となっていた汚染土壌については、同社が除去してから売却すると確認。市は一部を国際リニアコライダー（ILC）の関連施設に活用する計画で、売買契約の早期締結に向けて協議を進める。(Ichinoseki City and NEC Platforms (President Kimihiko Fukuda, Tokyo) have generally agreed that the city will acquire the site of the company's Ichinoseki Plant in Karakai, Tokyo. It was confirmed that the company would remove the contaminated soil, which had been an issue, before selling it. The city plans to utilize part of it for facilities related to the International Linear Collider (ILC), and will proceed with discussions toward the early conclusion of a sales contract.)

from Iwate Nippo

24 April 2021

ILC誘致、EU議長国として推進 スロベニア大使が意欲

スロベニアのアナ・ポラック・ペトリッチ駐日大使は22日、本県を訪れ、国際リニアコライダー（ILC）計画を推進する地元関係者と意見交換した。同国が7月から欧州連合（EU）の議長国になるため「計画を他国に広げたい」と積極姿勢を示した。(Slovenia's Ambassador to Japan, Ana Pollack Petric, visited the Iwate prefecture on 22 May and exchanged views with local officials promoting the International Linear Collider (ILC) program. She said she “wants to extend the plan to other countries” as the country will become the presidency of the European Union (EU) from July.)

from Nikkei

23 April 2021

次世代加速器を復興支援に 谷村邦久氏

先導となる計画の一つが宇宙誕生の謎に挑む次世代加速器「国際リニアコライダー」（ILC）。東北地方には古代に形成された硬い岩盤をもつ北上山地があり、世界が認める候補地となっている。(One of the leading plans is the next-generation accelerator “International Linear Collider” (ILC), which challenges the mystery of the birth of the universe. In the Tohoku region, there is the Kitakami Mountains with hard rock formed in ancient times, and it is a candidate site recognized by the world.)

from VERTIGO Política

21 April 2021

NUEVO LABORATORIO INTERNACIONAL DE LOS DOS INFINITOS

Física de partículas y detectores La colaboración franco-japonesa propone investigar las propiedades del Bosón de Higgs con el apoyo del experimento ATLAS, uno de los siete detectores de partículas construido en el Gran Colisionador de Hadrones (LHC), y del International Linear Collider (ILC), un acelerador lineal electrón-positrón. El Bosón de Higgs, que requirió 20 años de trabajo de investigación, fue observado por primera vez en 2012 en el LHC. Probablemente será reemplazado por un acelerador aún mayor que podría instalarse en Japón.(Particle physics and detectors The Franco-Japanese collaboration proposes to investigate the properties of the Higgs Boson with the support of the ATLAS experiment, one of the seven particle detectors built in the Large Hadron Collider (LHC), and the International Linear Collider (ILC), an electron-positron linear accelerator. The Higgs Boson, which required 20 years of research work, was first observed in 2012 at the LHC. It will likely be replaced by an even bigger throttle that could be installed in Japan.)

PREPRINTS

1 JUNE 2021

2105.12962

Physics reach of a long-lived particle detector at Belle II

2105.12276

Optimization of a traveling wave superconducting radiofrequency cavity for upgrading the International Linear Collider

2105.11189

A 96 GeV Higgs Boson in the 2HDMS: e^+e^- collider prospects

2105.11015

A high luminosity superconducting twin e^+e^- linear collider with energy recovery

2105.08616

Stau searches at the ILC

2105.07230

A new analysis of the pQCD contributions to the electroweak parameter ρ using the single-scale approach of principle of maximum conformality

2105.06665

Study of the $h\gamma Z$ coupling at the ILC

2105.06585

SDHCAL technological prototype test beam results

2105.06530

Probing the CP properties of the Higgs sector at ILC

2105.06408

Improved $(g-2)_\mu$ Measurements and Supersymmetry : Implications for e^+e^- colliders

2105.06135

Prospects for chargino pair production at CEPC

2105.05900

Beyond the CMOS sensors: the DoTPiX pixel concept and technology for the International Linear Collider A

2105.05718

A combined fit to the Higgs Branching Ratios at ILC

2105.05477

Possible benefit of longer L^* for detectors at ILC

2105.04049

Generating the full SM at linear colliders

2105.02474

Same-Sign Tetrilepton Signature in Type-II Seesaw at Lepton Colliders

2105.00128

$H \rightarrow$ invisible at the ILC with SiD

2104.13778

A new approach of estimating the Galactic thermal dust and synchrotron polarized emission template in the microwave bands

2104.10902

Probing the minimal $U(1)_X$ model at future electron-positron colliders via the fermion pair-production channel

2104.09924

Prospects for the measurement of the b-quark mass at the ILC

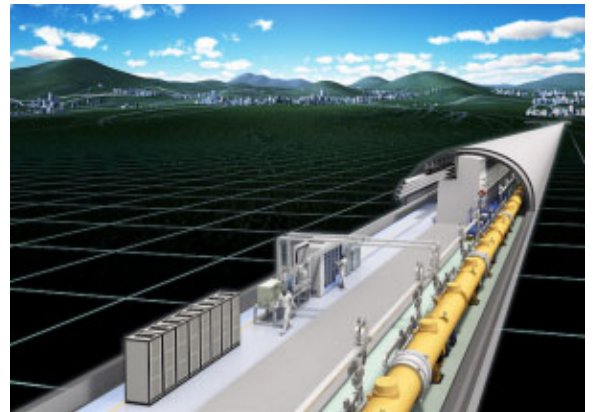
DIRECTOR'S CORNER

ILC Preparatory Laboratory proposal released

[Tatsuya Nakada](#) | [1 June 2021](#)

The ILC International Development Team (IDT) was established by the International Committee for Future Accelerator (ICFA) in August 2020, to prepare the ILC Preparatory Laboratory (Pre-lab) that would complete the technical development and engineering preparation for the International Linear Collider project to be ready for construction. During the same period, governmental authorities of interested nations are expected to forge an agreement on the sharing of the cost and responsibilities for the construction and operation of the ILC facility and on the organisational structure and governance of the ILC Laboratory.

After ten months of work, the IDT has achieved the first major milestone of completing the ILC Pre-lab proposal, which outlines the organisational framework, an implementation model and work plan of the Pre-lab. Three working groups were the key players and an impressive number of people have been contributing to this effort. Working Group 1 worked on the mandate, governance model, organisational structure and Pre-lab start-up procedure. Working Group 2 identified necessary technical development and engineering preparation work for the ILC accelerator and site construction. Working Group 3 discussed a strategy for developing the compelling ILC physics programme. Then the Executive Board took the responsibility of compiling the document. It was very encouraging to see the growing number of participants in those activities.



Artist's impression of the ILC. Image: Rey. Hori

The IDT activity now enters the next phase of implementing the steps for establishing the Pre-lab along the lines described in the proposal. The plan for the accelerator technical development and engineering preparation work needs to be further elaborated and people and laboratories with interest and expertise in the work must be identified. The physics community needs encouragement and support for further exploring the physics potential of the ILC and converging towards concrete designs of experiments. Discussion on the Pre-lab start-up process must be initiated among the world key laboratories.

The IDT activity now enters the next phase of implementing the steps for establishing the Pre-lab along the lines described in the proposal. The plan for the accelerator technical development and engineering preparation work needs to be further elaborated and people and laboratories with interest and expertise in the work must be identified. The physics community needs encouragement and support for further exploring the physics potential of the ILC and converging towards concrete designs of experiments. Discussion on the Pre-lab start-up process must be initiated among the world key laboratories.

An equally crucial factor now is to understand what kind of process is needed to achieve the establishment of the Pre-lab. Unlike the ILC itself, the Pre-lab activities will be driven at the level of laboratories rather than having a direct involvement of governmental authorities. For the managements of interested laboratories to engage seriously in the discussion of responsibility sharing for the Pre-lab activities, however, a signal from the Japanese government indicating its interest in hosting the ILC and supporting the Pre-lab would be required. In parallel, we will make further effort to gain more support for the ILC worldwide.

We will continue to do our best for the swift realisation of the Pre-lab. Exciting times are head of us all.

[Read Full text of Proposal for the ILC Preparatory Laboratory \(Pre-lab\)](#)

ANNOUNCEMENTS

ILCX 2021: Let's discuss about possible experimental opportunities at the ILC

[Hitoshi Murayama](#) | [1 June 2021](#)

The ILC International Development Team (IDT) will hold the ILC Workshop on Potential ILC Experiments (ILCX), from 26 – 29 October, 2021.

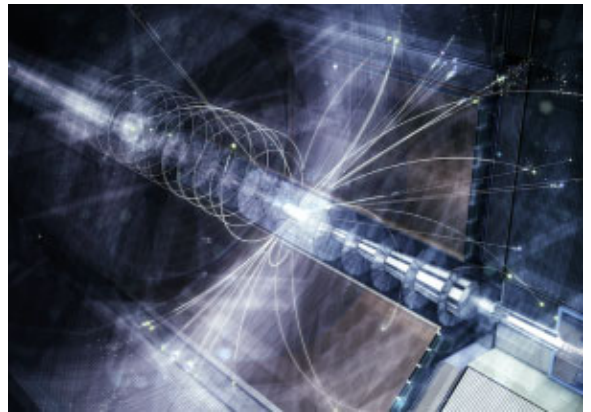
With the growing anticipation that the preparatory laboratory (Pre-lab) will be launched in the near future, we would like to initiate serious discussions about all the possible experimental opportunities at the ILC laboratory. The workshop will address all the aspects of the collider program at the Interaction Point (IP), including ideas for new detector technologies or concepts, detector performance and physics reach, software and computing, and theoretical developments. In addition, possible beam dump experiments, forward detectors near the IP, off-axis far detectors, experiments with extracted beams for particle physics and other areas of science, including e.g. nuclear physics, condensed matter physics. Some of these ideas will require additional infrastructure and civil engineering, and therefore need to be incorporated into the ILC site planning during the four years of the Pre-lab, hence discussions is needed rather soon.

The workshop organizing committee is the Executive Board of IDT, and the program committee is the Steering Group of Working Group 3 (Physics and Detector). Given the uncertainties with the COVID-19 situation, three possible styles are being prepared in parallel: (1) in-person meeting in Tsukuba, Japan, (2) hybrid meeting on the KEK site, and (3) fully online meeting. Decision between (1) vs (2,3) will come by the end of June. In the case of in-person meeting, a visit to ILC-related sites at KEK is being arranged on Oct 25, while an excursion to the candidate ILC site in Tohoku is being planned after the workshop.

The [ILCX2021 website](#) has opened. Since how we organize the meeting has not yet decided, registration is not open. Please stay tuned for more information!

[DETECTOR R&D](#) | [ILC PHYSICS](#) | [JAPAN](#) | [PRE-LAB](#)

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ILC collision image. Image: Rey. Hori

AROUND THE WORLD

Accelerating around the globe: big logistics experiment kicks off with Pre-lab phase

[Barbara Warmbein](#) | [1 June 2021](#)

When the Pre-Lab phase kicks off with the beginning of next year, there'll be an enormous increase of ILC R&D activities around the world. One of these is a project called "Cryomodule Global Transfer" – though "a global logistics ballet of accelerator parts" would be just as fitting. Over a period of four years, six fully functioning cryomodules (12-metre units housing the actual accelerating parts of the future 20-kilometre ILC) will be produced including all necessary components; two in each region of the ILC. That means 16 cavities, tuners and couplers and two cold-mass and vacuum vessels for each region, plus assembly and other parts.

Once the complete modules are tested in Europe and the Americas, they will be shipped to Japan, tested again, and shipped back. "This is a crucial dry run for the logistics of future cryomodule serial production and the conformity to Japanese safety regulations," says Shinichiro Michizono, who leads the ILC accelerator design efforts in the International Development Team.

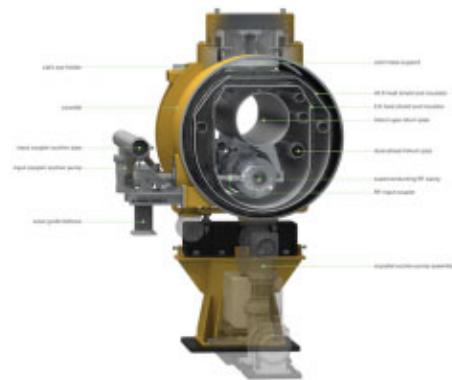
While it has become quite normal for large accelerator systems to be built in different labs and companies and shipped to the host lab, the logistic effort needed for the ILC will surpass everything that has happened before. The sooner any hurdles or bottlenecks are identified, the better, so that eventually all 8000 cavities in all 900 cryomodules that will be needed, can be installed and geared up for acceleration in the ILC main linacs.



A klystron produced in Japan for the European XFEL arriving in Germany. Transporting high-tech equipment around the world complicated business and needs testing – just like the parts themselves. Image: DESY / European XFEL / KEK

US. This means the expertise to build functioning accelerators – cavities, cold mass, tanks, tuners, couplers, you name it – exists both in industry and in the associated labs.

By the beginning of the Pre-Lab phase it will be clear which labs will lead the effort in their respective region to build the two complete modules. However, cavity production will have to adhere to the very strict "High-Pressure Gas Safety Regulations" in place in Japan for any compressed gas greater than a certain pressure or for liquified gas. Most likely the fabrication process itself and the high-pressure gas safety must be checked by licensed authorities or inspectors before cavities can be imported; if they don't meet the regulations, the



Cross section image of ILC cryomodule Image: Rey. Hori

The general assumption is that once the project is approved and MOUs and agreements have been signed, all regions will contribute a certain number of cryomodules to the real ILC. This saves time, as production and testing can go ahead at three different regions in parallel. However, it also means that the bulky yet high-tech accelerator modules will have to travel to Japan by ship. Recently the world had to learn that ships can get stuck in the Suez Canal... something that is hard to risk-assess. However, there are much more fundamental risks to be considered. For example, the baseline ILC cryomodule is 12.4 metres long – slightly too long for a standard 40-ft shipping container. "We are pursuing containers longer than the standard one," Michizono explains. But if that does not work out or proves too expensive, they might have to go back to the drawing board: "If it's necessary we will need to update the cryomodule design," he says.

Several accelerators operating with the chosen ILC technology superconducting RF are under construction or in operation in different labs around the world, notably the European XFEL in Germany and LCLS II in the

cryomodules may not be cooled down and RF-tested in Japan. The collaborators on the Cryomodule Global Transfer are prepared to do just that in case there is not enough time to produce fully facilitating cryomodules – efforts to adapt cryomodules to the Safety Regulations and the Global Transfer project would then run in parallel for simple physical shipment as the first step and for preparing the fully facilitating cryomodule shipment as the second step.

The project is expected to last the whole of the Pre-Lab phase (assuming budgets allow for it). The production of 9-cell cavities and other parts will last around two years. The fully facilitating cryomodule assembly and testing is likely to take another year. The shipping test is penciled in for year four. We'll keep you updated on progress and further plans, hurdles and successes.

[ACCELERATOR R&D](#) | [CRYOMODULE](#) | [EUROPEAN XFEL](#) | [PRE-LAB](#) | [SCRF](#)

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