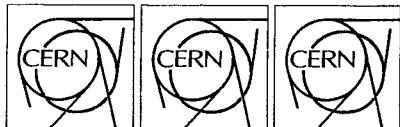


bulletin



Semaine du lundi 21 juillet

no 30/97

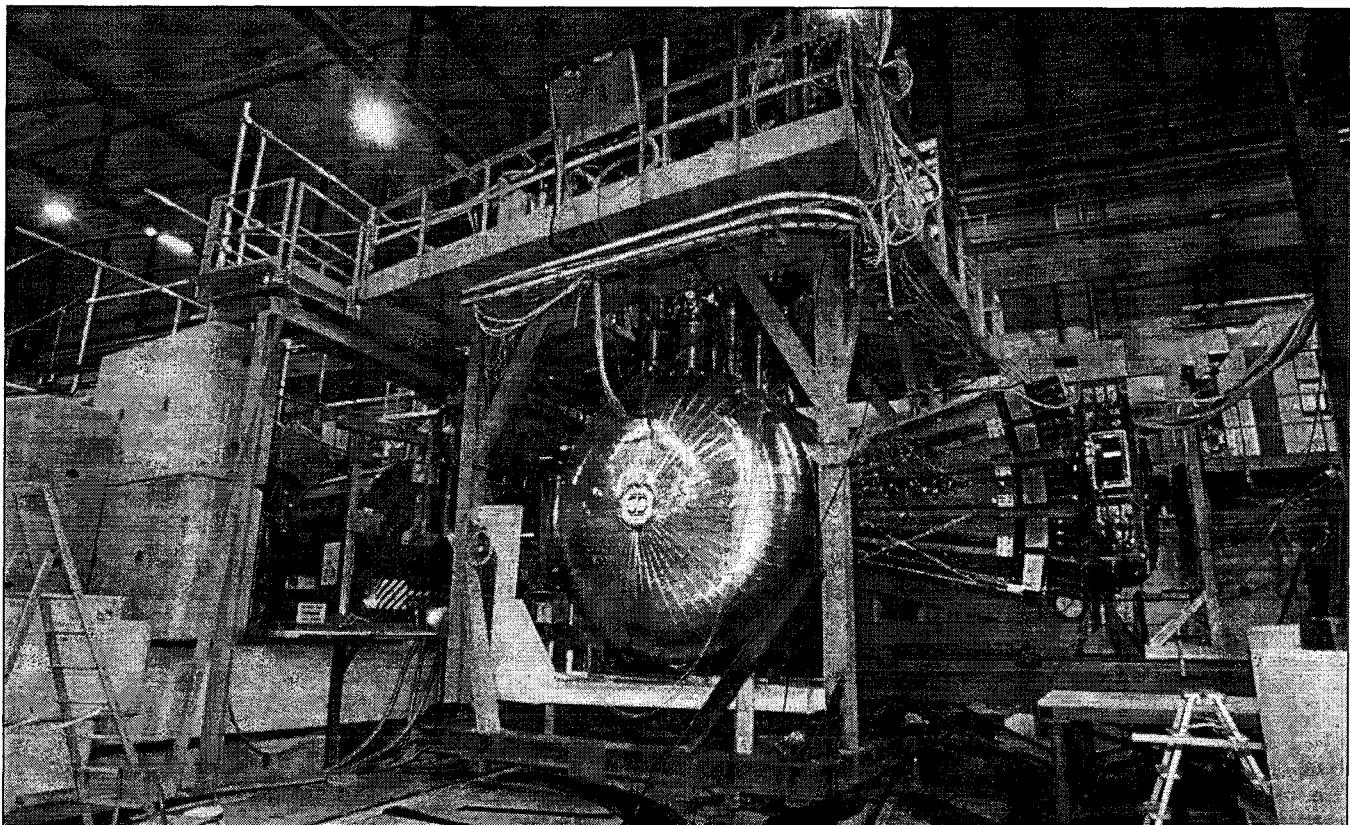
Week Monday 21 July

Approbation d'un premier rapport de conception technique pour l'un des détecteurs du LHC

Une étape décisive a été franchie la semaine dernière sur le chemin menant au LHC avec l'approbation officielle par le Directeur général du premier rapport de conception technique (TDR) relatif à l'un des détecteurs du

First Technical Design Report for an LHC detector approved

A historic step was taken on the road to the LHC last week when the Director General formally approved the first Technical Design Report, TDR, for an LHC detector. For the ATLAS calorimetry community, whose TDR it was,



Montage dans un faisceau (en 1994) des prototypes des calorimètres à argon liquide et à carreaux de scintillateur d'ATLAS pour des essais combinés. Le travail va de l'avant pour les prototypes en vraie grandeur de ces détecteurs.

LHC. Pour toute l'équipe de la calorimétrie dans ATLAS, qui avait élaboré ledit rapport, cette approbation marque l'aboutissement d'un long et impressionnant programme de R & D, d'études approfondies, de simulations et d'essais; elle donne aussi le feu vert pour la construction du détecteur

Prototypes of the ATLAS liquid argon and tile calorimeters in a combined test beam set-up in 1994. Work is now progressing on full size prototypes of these detectors.

this marks the culmination of a long and impressive programme of R&D, intensive studies, simulations and tests, allowing construction to begin on the actual detector itself. The ATLAS calorimetry TDR is the first of many currently being prepared. Five more from ATLAS and CMS are

DERNIÈRE MINUTE

Félicitations à tous ceux qui, grâce à leurs efforts, ont contribué au démarrage réussi du LEP aussi vite que possible après l'incendie du 13 mai dans le bâtiment BA3. Le premier faisceau d'électrons a circulé dans le LEP dans la nuit du 12 juillet et on espère qu'après de nouveaux travaux cette semaine les premières expériences d'étalonnage des Z^0 auront lieu durant le week-end, bien avant la date prévue. Un rapport complet sera publié dans le prochain Bulletin hebdomadaire.

STOP PRESS

Congratulations to all concerned in the successful efforts to start up LEP as quickly as possible after the fire in BA3 on 13 May. The first beam of electrons circulated around LEP in the night of 12 July and after further work this week it is hoped that the first Z^0 calibration physics will take place over the weekend, way ahead of schedule. A full report will appear in the Weekly Bulletin next week.

proprement dit. Le TDR relatif à la calorimétrie dans ATLAS est le premier de nombreux rapports en cours d'élaboration. Cinq autres TDR d'ATLAS et de CMS se trouvent déjà à diverses étapes de leur évaluation et d'autres encore sont attendus.

Comme l'exige la complexité des détecteurs, la procédure d'approbation des expériences LHC doit s'articuler en plusieurs étapes. Une interaction intense est nécessaire entre les collaborations et les rapporteurs et consultants du Comité des expériences au LHC (LHCC) pour que les études et les plans des détecteurs convergent et aboutissent à l'approbation des TDR.

Les manifestations d'intérêt originelles de 1992 pour des expériences polyvalentes au LHC ont été suivies par un certain nombre de lettres d'intention. L'étape suivante pour les projets sélectionnés à ce stade comprenait l'élaboration de propositions techniques détaillées. Celles des collaborations ATLAS et CMS avaient été soumises à la fin de 1994 et celle d'ALICE en 1995/1996. Les projets ATLAS et CMS ont été approuvés au début de 1996, sous condition qu'avant de passer à la phase de construction finale chaque sous-système fasse individuellement l'objet d'un examen technique, financier et sur les effectifs, examen effectué sur la base du rapport de conception technique concerné.

Les TDR sont des documents détaillés de plusieurs centaines de pages, décrivant dans le détail la construction des divers sous-systèmes. Dès l'approbation d'un TDR, la collaboration peut passer de l'étape de la R & D, de la planification et de la réalisation de prototypes à celle de la construction du détecteur proprement dit et de l'élaboration des contrats avec les instituts et les entreprises concernées pour les éléments à fabriquer.

Lors de l'approbation des propositions techniques d'ATLAS et de CMS, le Directeur général avait également précisé que la construction des détecteurs devrait respecter certaines limites budgétaires. Ce plafonnement des dépenses constitue une certaine garantie pour les organes de financement, mais c'est une politique contraignante pour les collaborations. Il signifie que toute augmentation du coût réel d'une partie du détecteur au-delà des estimations initiales doit être compensée par des économies à réaliser ailleurs. A l'époque, il avait été considéré comme prématûre de fixer les montants exacts, compte tenu de diverses incertitudes. Maintenant, cependant, le Directeur général estime que la situation a suffisamment évolué pour que ces plafonds soient définis. Ils s'appuient sur des estimations de coûts faites par les collaborations et revues par le comité CORE (examen des coûts) du LHCC et ont été examinés par les comités d'examen des ressources, au sein desquels les collaborations, la Direction du CERN et les organes de financement sont représentés.

already in various stages of review, and others are awaited.

In line with the complexity of the detectors, the procedure for approval of LHC experiments has to be a multi-stage process. Intensive interaction is needed between the collaborations and the Large Hadron Collider Committee (LHCC) referees and consultants, to result in convergence on approved detector designs and plans.

The original Expressions of Interest in 1992 for general purpose LHC experiments were followed by a number of Letters of Intent. The next step for those experiments which were selected at this stage involved the preparation of detailed Technical Proposals. These were submitted by ATLAS and CMS at the end of 1994 and by ALICE in 1995/1996. The ATLAS and CMS projects were approved at the beginning of 1996, on the condition that before proceeding to the final construction phase each subsystem will be subject to a technical, financial, and manpower review based on a Technical Design Report for each subsystem.

The TDRs are detailed documents running to hundreds of pages, describing just how the particular subsystem will be built. On approval of a TDR, the collaborations can move from the R&D, planning and prototyping stage to building the actual detector, making contracts for production items with the institutes and companies involved.

When approving the ATLAS and CMS Technical Proposals, the Director General also specified that the detectors must be built inside cost ceilings. This gives funding agencies some confidence that costs will not escalate, but it is a tough policy for the collaborations to implement. It means that any increase in real costs in one part of the detector beyond the original estimates means that savings must be made elsewhere. At the time, it was thought premature to fix the actual amounts, in view of various uncertainties. Now, however, the Director General considers that the situation has evolved sufficiently for these ceilings to be fixed. They are based on cost estimates made by the collaborations reviewed by the LHCC's Cost Review Group "CORE". These have been discussed by the Resource Review Boards involving the collaborations, CERN management and the funding agencies.

*Les journalistes scientifiques
de demain
visitent le CERN*

*Future science journalists
visit CERN*



Quinze étudiants italiens en maîtrise de communication en science de la SISSA, à Trieste, ont visité le CERN lors d'une Session spéciale prévue par leurs cours. Ils avaient pour tâche la recherche et la rédaction d'articles inclus dans ce Bulletin. Pour ce supplément, les articles paraissent exceptionnellement en italien, français et anglais, soulignant la collaboration internationale de notre Laboratoire.

Fifteen Italian students of the Master's Course in Science Communication of SISSA in Trieste visited CERN for a special session of their course. They were given the task of researching and writing articles for this special section of the Weekly Bulletin. For this special supplement, the articles appear in Italian, French and English underlining the European collaboration in our Laboratory.

Contro il cancro i "proiettili magici" di Isolde

Fisica & medicina alleate contro il cancro: la notizia arriva dal CERN dove è in corso l'esperimento IS 330 sull'uso di fasci di ioni radioattivi nella ricerca biomedica. Come era già accaduto ai tempi della costruzione del prototipo del tomografo ad emissione di positroni (PET) disegnato dagli scienziati del CERN per i medici dell' Hopital Cantonal di Ginevra, si tratta ancora una volta di una felice *joint-venture*. Una collaborazione che ribadisce la possibilità e l'efficacia del dialogo fra scienza pura e scienza applicata.

"Questa nostra collaborazione non rientra certamente nella *routine* medica - conferma G. J. Beyer, *spokesman* ufficiale degli esperimenti - perché non dobbiamo dimenticare che il CERN è sostanzialmente un istituto di ricerca sui problemi fondamentali della fisica delle particelle.

Come in tutti i centri di ricerca di questo tipo, le tecnologie sviluppate (ad esempio i rivelatori di particelle) hanno tuttavia importanti ricadute nell'industria e nelle scienze applicate, medicina compresa".

E' proprio il caso degli esperimenti della Clinica Universitaria di Ginevra, che sfruttano l'enorme potenziale di ISOLDE, il separatore di isotopi del CERN: un fascio di protoni da 1 GeV viene diretto contro un bersaglio, producendo una gamma quasi completa di isotopi estremamente rari, di una purezza senza precedenti e in quantità tali da permettere ricerche biomediche sistematiche prima di oggi irrealizzabili. Come sfruttare tutti questi dati nel difficile ambito della ricerca sul cancro? "Gli approcci possibili sono due", spiega Beyer. "Entrambi lasciano ben sperare. Il primo è quello di esporre le cellule tumorali alla radiazione dall'esterno (è l'approccio su cui si basa TERA, il progetto di Ugo Amaldi). La seconda possibilità è invece trasportare gli isotopi radioattivi all'interno delle cellule tumorali, dove essi possono "depositare" la loro radiazione. Ma per farlo, abbiamo bisogno di molecole intelligenti: si tratta dei nostri "proiettili magici", anticorpi monoclonali che, marcati con isotopi radioattivi e iniettati nell'organismo, sono in grado di trovare da soli la strada delle cellule tumorali all'interno delle quali trasportano gli isotopi".

E i rischi di radiazioni per il paziente? "Davanti a una persona malata di cancro non abbiamo molte scelte: dobbiamo somministrare la dose di radiazioni massima per poter uccidere il tumore senza compromettere i tessuti sani che circondano quest'ultimo". Beyer conclude citando Paracelso, famoso scienziato e alchimista vissuto circa cinquecento anni fa: "E' solo la dose che decide se una sostanza è velenosa oppure no". Un po' come il sale nella minestra...

Davide Zoleto

Isolde's "magic bullets" against cancer

Physicists and physicians together to fight against cancer. The news comes from CERN, where experiment IS 330 is underway on the use of radioactive ion beams in biomedical research. As had been the case with the construction of the prototype of PET (Positron Emission Tomography) scanner designed by CERN scientists for the Geneva Cantonal Hospital, once again this is a fortunate joint venture. A collaboration that confirms the possibility of dialogue and cross-fertilization between pure science and applied research.

"The work we do in this collaboration is not medical routine - says G. J. Beyer, the experiment's spokesman. We should not forget CERN is basically a research institute in fundamental particle physics. However, as is always the case in this kind of laboratory, the technologies developed (for instance particle detectors) do have significant industrial and applied spin-offs also in medicine, among other fields."

This can be said of the Geneva University Hospital experiment, that uses the enormous potential of ISOLDE, the CERN online isotope separator facility. A

1 GeV proton beam is directed against a target to make available, for instance, an almost complete range of rare earth isotopes of unprecedented purity and in such a quantity to enable systematic investigations quite unprecedented in biomedical work. How are the results obtained used in such a difficult field as cancer research? "There are two possible and encouraging approaches in the use of radiation against cancer - explains Beyer. One possibility is to expose cancer cells to radiation from the outside (TERA, Ugo Amaldi's project, is based on this approach). The second approach is to carry radioactive isotopes into the cancer cells, where they deposit their radiation. We need intelligent molecules to do that, and these are our "magic bullets", that is monoclonal antibodies labelled with radioactive isotopes injected into the body, where they are able to find their way to the cancer cells and to carry isotopes into them".

Are there radiation risks for the patients? "With a cancer patient we do not have much choice: we have to administer the highest radiation dose needed to kill the cancer without jeopardizing the healthy tissues surrounding it". And Beyer quotes Paracelsus, medieval alchemist-scientist: "It's the dose that makes something poisonous or not". Just like salt in your soup!

by Davide Zoleto

LEIR risorge dalle ceneri di LEAR

"Nulla si crea, nulla si distrugge ma tutto si trasforma".

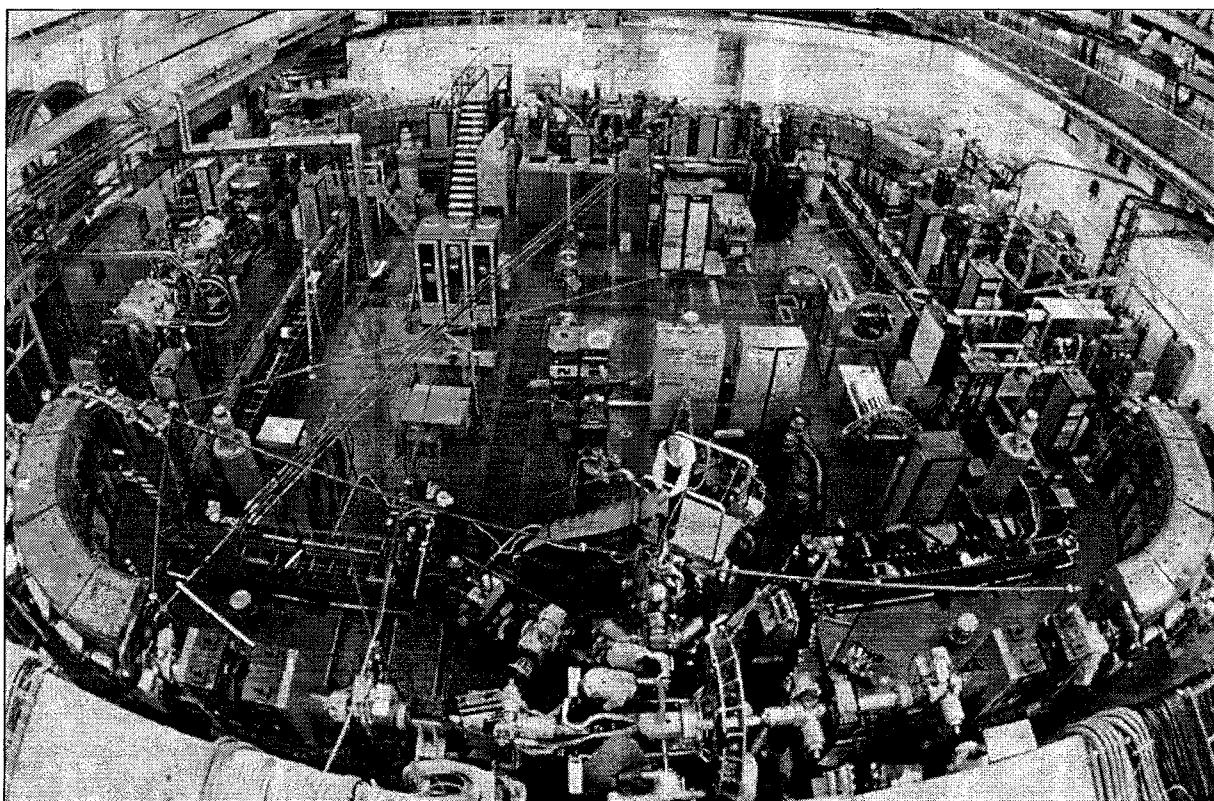
Questo è più o meno quello che succede al CERN. Alla fine del 1995, i primi atomi di antimateria, in particolare un atomo di anti-idrogeno, è stato creato grazie all'esperimento LEAR (Low Energy Anti-proton Ring). La macchina ha concluso una carriera di 16 anni piena di successi nel 1996. Lo scorso dicembre è stata definitivamente spenta, ma non per sempre. LEAR è un altro esempio di come al CERN tutto sopravviva con un impiego minimo di risorse economiche e talvolta, come in questo caso, anche umane. La parola chiave per la rinascita di LEAR è adesso "ioni", e la macchina verrà ribattezzata LEIR: Low Energy Ions Ring. Il suo futuro è quello di essere un passaggio obbligato per gli ioni di piombo destinati a LHC.

Saranno necessarie soltanto poche modifiche e un'eventuale ottimizzazione delle prestazioni del sistema di raffreddamento a elettroni per consentire alla macchina di produrre fasci molto densi di ioni per le future collisioni in LHC. Il sistema di raffreddamento a elettroni consente agli ioni di piombo di viaggiare in fasci molto densi mantenendo la stessa velocità. I risultati ottenuti con i test effettuati

LEIR resurrected from LEAR's ashes

"Nothing is created, nothing is destroyed, everything changes". This is more or less what happens at CERN. At the end of 1995, the first atoms of anti-matter, in the form of antihydrogen, were created at LEAR (Low Energy Anti-proton Ring). The machine concluded a 16 years successful career in 1996. Last December it shut down, but not forever. LEAR is another example of how, at CERN, facilities can survive even with modest financial resources and, sometimes, as in this case, human resources. The key word for LEAR rebirth is now "ions", and the machine will be renamed LEIR: Low Energy Ions Ring. It will become the compulsory passage for lead ions for LHC.

The machine will need only minor modifications with an eventual upgrade of the electron cooling device to produce very dense ion beams for future collisions in LHC. In LEIR, lead ions will be accumulated and cooled by electrons. The electron cooling device allows lead ions to travel in very dense beams by maintaining the same speed. The results coming from the tests performed up to now have been very encouraging. By further improving the vacuum the ions' lifetime in the machine has approached



finora sono molto incoraggianti. Facendo un vuoto ancora più spinto, la vita media degli ioni nella macchina ha raggiunto i 30 secondi. Un risultato importante sarà quello di aumentare sempre di più la velocità di raffreddamento per consentire al nuovo sistema di iniezione multipla di ioni in LEAR di entrare efficacemente in funzione.

Non più di 10 scienziati stanno attualmente lavorando al progetto e LEAR si prepara ad essere una parte indispensabile nella catena di iniezione di ioni e particelle che culminerà in LHC. Sarà in grado di accumulare una quantità enorme di ioni di piombo. L'utilizzo del sistema di raffreddamento ad elettroni diverrà routine nella macchina e per questo dovrà essere altamente affidabile. Niente male per una macchina che va in pensione.

Tiziana Lanza

30 seconds. An important achievement will be increasing even more the cooling speed that will be able to make the novel multi-turn injection of lead ions into LEIR possible.

No more than 10 scientists are working full time at the project and LEIR is preparing to be an important part of the chain injection leading to LHC. It is going to be able to accumulate ions at low energy which is not easy to obtain. It will use routinely the electron cooling device that has to be highly reliable.

Not bad for a machine in retirement.

by Tiziana Lanza

Nuovi orizzonti per la criogenia

Sarà la criogenia la chiave d'accesso al mondo delle particelle elementari.

Nel caso di macchine acceleratrici di grandi dimensioni, per poter ottenere fasci sempre più energetici si possono seguire due strade: aumentare la circonferenza dell'anello, oppure generare campi magnetici più intensi. Nel caso di LHC (che – come è noto – verrà costruito nello stesso anello che oggi ospita il LEP) si è scelta la seconda strada, utilizzando magneti superconduttori realizzati con una lega di niobio e titanio alla temperatura di circa 2 gradi Kelvin e attraversati da una corrente di circa 13000 Ampere.

Per alimentare le spire dei magneti si devono utilizzare dei cavi non superconduttori in rame (*current leads*) che dall'esterno (dove la temperatura è di circa 25 gradi Celsius) entrano in un ambiente mantenuto a 2 gradi sopra lo zero assoluto e si collegano direttamente ad esse. Questo genera due tipi di problemi al sistema raffreddato: il cavo in rame dissipà energia termica per effetto Joule e la conduzione termica è così elevata da determinare un aumento della potenza di raffreddamento necessaria per mantenere la temperatura al livello desiderato.



Studenti del Master in Comunicazione della Scienza della SISSA di Trieste a colloquio con l'Ing. Vittorio Parma che illustra i principi di funzionamento della macchina LHC.

Per ridurre tali perdite è stato previsto un sistema che utilizza, in luogo del materiale non superconduttore, uno o più cavi HTS (High Temperature Superconductor). Essi hanno caratteristiche di supercondutività anche a temperature più elevate di 2 gradi Kelvin (minimizzando l'effetto Joule) e di pessima conduzione di calore (minimizzando la conduzione termica). Tale cavo è un nastro ricoperto da una guaina di argento, ottenuto con una miscela a base di Bismuto e riesce ad abbassare il carico termico del sistema di un fattore 10.

Il progetto verrà testato il prossimo anno, a livello di prototipo, sullo LHC Test-String Cryogenic system, un modello in scala 1:1 lungo 50 metri della macchina, già in uso sin dal 1994.

Questo tipo di tecnologia potrà avere applicazioni anche al di fuori dell'ambito della ricerca di base: a Ginevra è già stato realizzato il primo trasformatore con materiali HTS e diverse aziende europee, americane e giapponesi lavorano da tempo alla produzione di linee di trasmissione di potenza usando questi materiali per trasportare più efficacemente l'energia con un più basso impatto ambientale.

Lucia De Francesco / Bruno Niceforo / Lorenzo Galante

Comprendre les supernovas à travers l'expérience MISTRAL

L'expérience MISTRAL est désormais en cours de construction. Le spectromètre de masse, qui en est le cœur, a été installé dans le séparateur de masse de ISOLDE, au CERN, et son premier fonctionnement est prévu pour novembre 1997. Quel est l'objet de cette expérience? Le spectromètre de masse de type Smith permettra la détermination précise de la masse d'isotopes dont l'existence se limite à environ 10 millisecondes. La valeur de ces masses devrait permettre la vérification de l'évolution stellaire de modèles astrophysiques. On sait qu'une supernova, durant son explosion, crée un important flux de neutrons. Les nucléus vont capter ces neutrons et construire des isotopes, lourds et instables. En quelques millisecondes, ces isotopes vont se décomposer en des particules plus stables et par conséquent, s'éparpiller dans l'espace dans une explosion de supernova. Le rapide processus nucléaire joue un rôle fondamental dans la création d'éléments plus lourds présents dans l'Univers. Il suit une trajectoire particulière. Ceci explique l'abondance relative de ces éléments dans l'Univers. Les modèles

qui génèrent la trajectoire actuelle du processus-r seront fortement améliorés par la connaissance de l'importance d'énergie de réaction disponible dans une supernova: ce paramètre est complètement dépendant de la différence de masse atomique entre les isotopes. C'est ici que l'on trouve l'importance de l'expérience MISTRAL: les isotopes, lourds et de courte durée, générés dans le séparateur de masse ISOLDE par un faisceau de proton PS-BOOSTER de 1 GeV, verront leur masse ainsi mesurée à environ 0,5 parts par million.

Des 6000 ou 7000 configurations isotopiques possibles, la masse atomique de moins de 2000 a été mesurée jusqu'à maintenant avec le degré nécessaire de précision mais il semble qu'un large nombre des plus lourds et plus instables isotopes ne sera jamais produit et mesuré.

Les nouvelles données acquises par MISTRAL vont sans doute permettre de sélectionner certains modèles astrophysiques de prédiction de masse qui, de nos jours, montrent de différence d'ordre de 10 MeV, au lieu d'une différence d'ordre de keV, ou moins. Ceci sera nécessaire à la reproduction convenable de l'abondance d'éléments que nous détectons dans l'Univers.

Ezio Plenizio et Giulia Vannoni

Understanding supernovae with the MISTRAL experiment

The MISTRAL experiment is on its way. The mass spectrometer, which is its core, is now installed in the ISOLDE on-line mass separator at CERN and the first run will be performed in November 1997. What is the aim of the experiment? The Smith type mass spectrometer will allow the accurate determination of the mass of very short lived (about 10 msec) isotopes. These mass values should allow the verification of astrophysical models of stellar evolution. It is well known that supernovae, during their explosive stage, experience very large neutron fluxes. Nuclei will capture these neutrons and build up unstable heavy isotopes. In a few milliseconds these isotopes will decay into more stable ones and be subsequently scattered in space

by the supernova explosion. The rapid nuclear capture process plays a fundamental part in the creation of the heavier elements present in the Universe and follows a particular path, which explains the relative abundance of elements in the Universe.

The models generating the actual path will be greatly improved by the knowledge of the amount

of reaction energy available in a supernova: this parameter is crucially dependent on the difference in atomic mass between isotopes. Here lies the importance of the Mistral experiment: the short lived heavy isotopes generated in the ISOLDE on-line mass separator by a 1 GeV PS-BOOSTER proton beam, will have their mass measured up to an accuracy of about 0.5 part per million.

Of the about 6000 or 7000 possible isotopic configurations, the atomic mass of less than 2000 has so far been measured with the necessary degree of accuracy and it is likely that large numbers of the heavier and more unstable isotopes will never be produced or measured. Certainly, the new data acquired by MISTRAL will allow to select among astrophysical models of mass prediction which, nowadays, show differences of the order of 10 MeV, instead of the difference of the order of keV, or less, which would be required to properly reproduce the abundance of elements we detect in the Universe.

by Ezio Plenizio and Giulia Vannoni

Antimateria a basso costo

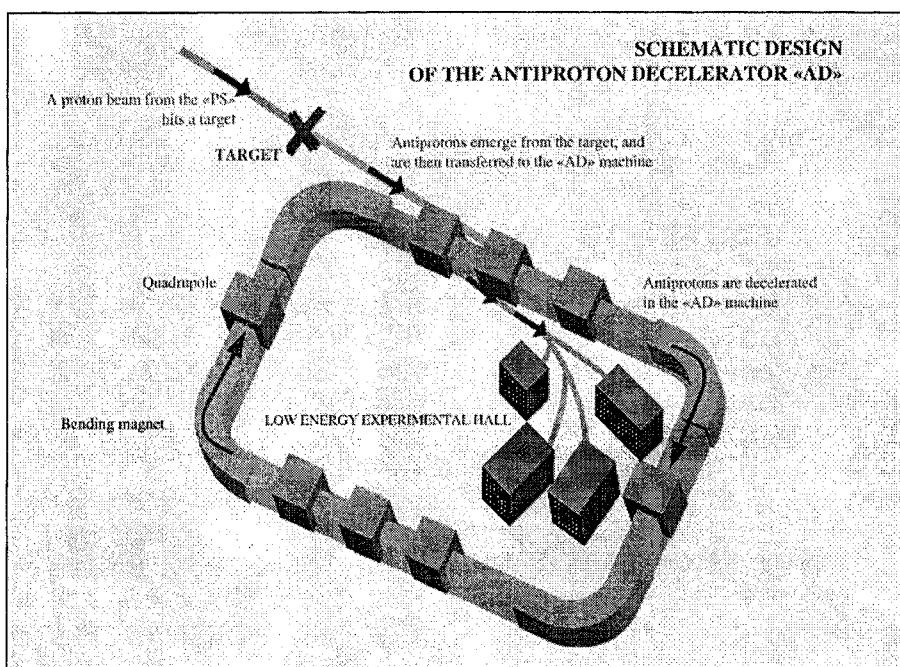
Ridurre le spese per continuare la ricerca sull'antimateria. E' questa l'equazione intrattabile che AD (Antiproton Decelerator) deve risolvere. La nuova macchina infatti sostituirà le quattro strutture utilizzate per gli esperimenti sull'antimateria che all'inizio dello scorso anno focalizzarono sul CERN l'attenzione della stampa di mezzo mondo. Una popolarità inaspettata per un esperimento che si colloca ai margini della ricerca che si svolge a Ginevra ma che, con la creazione di nove atomi di anti-idrogeno, ha suscitato l'interesse di alcuni Paesi stranieri, in particolare Giappone, Germania, Italia, USA, Danimarca e Polonia. Questi paesi deciso di finanziare il proseguimento delle ricerche per un ammontare complessivo di circa sette milioni di franchi svizzeri.

Per gli esperimenti sull'antimateria, che partiranno nei primi mesi del 1999, il ciclo di decelerazione degli antiprotoni fino a 100 MeV/c, necessario per poter imbottigliare gli atomi di anti-idrogeno, si svolgerà interamente all'interno dell'AD, una

Antimatter at low cost

Cut costs and continue the antimatter research. This is the untractable equation the AD project (Antiproton Decelerator) must solve. This new machine will replace the four structures utilized so far at CERN in previous antimatter experiments, which, last year, hit the headlines in the international press when nine atoms of antihydrogen were created. Such media attention came unexpected for an experiment which was, after all, in the sidelines of the mainstream research which is carried out at CERN but generated the attention of such nations as Japan, Germany, Italy, USA, Denmark and Poland. These countries decided to finance the continuation of the research for a total amount of about seven million Swiss Francs.

In the new antimatter experiments, which will start at the beginning of 1999, the deceleration cycle of antiprotons down to 100 MeV/c, necessary to trap the antihydrogen atoms, will be carried out entirely inside the AD, a machine



macchina derivata dall'attuale Antiproton Collector (AC). Gli studi effettuati fino ad ora hanno mostrato la necessità di correggere l'orbita del fascio durante la decelerazione e di migliorare il vuoto all'interno della macchina. Inoltre sarà molto importante stabilizzare l'alimentazione elettrica, poiché alle basse energie richieste in questo tipo di esperimenti le particelle che compongono il fascio sono estremamente sensibili a ogni campo magnetico. La produzione di antiprotoni beneficerà dei miglioramenti apportati al Proton Synchrotron in preparazione al suo futuro ruolo come parte della catena di iniezione di LHC. Durante il processo di decelerazione il fascio di antiprotoni subirà due fasi di raffreddamento stocastico e, una volta raggiunte energie di 300 e di 100 MeV/c, due fasi di raffreddamento elettronico. Al momento si è riusciti ad ottenere una decelerazione fino a 420 MeV/c, ma il gruppo di ricerca conta di raggiungere la condizione programmata entro la fine del 1998. Nessuna macchina al mondo sarà in grado di fornire prestazioni come quelle previste per AD, e gli esperimenti programmati potranno contribuire alla comprensione delle proprietà di simmetria fra materia e antimateria previste dal Modello Standard.

Margherita Fronte e Ezio Plenizio

derived from the former Antiproton Collector (AC). The machine studies carried out so far have shown the necessity of correcting the beam close orbit during deceleration and to improve the vacuum inside the machine. Furthermore it will be important to stabilize the power supply, as at the very low energies involved in this kind of experiments, the beam is very sensitive to magnetic fields. The production of antiprotons will benefit from the improvements carried out on the Proton Synchrotron in preparation to its future role as part of the LHC injection chain. During the deceleration process, the antiproton beam will be twice stochastically cooled, and, as energies of 300 MeV/c and 100 MeV/c will be reached, it will be cooled by electronic cooling. Until now, the lowest momentum achieved was 420 MeV/c, but the team is confident it will reach the required conditions by the end of 1998. No machine in the world will be able to perform as AD and its experimental programme will certainly contribute to a better understanding of the symmetric properties of matter and antimatter as foreseen by the Standard Model.

Margherita Fronte and Ezio Plenizio

L'éénigme du neutrino

La masse des neutrinos: une éénigme dont dépend notre conception de l'Univers et de la structure de la matière et qui espère trouver une réponse définitive par les différentes expériences du CERN: CHORUS et NOMAD désormais presque achevées, TOSCA, OPERA, ICARUS, encore en phase de projet.

Les neutrinos sont les particules les plus élusives: très nombreux mais impossible à attraper, ils interagissent si faiblement avec la matière qu'ils peuvent traverser le globe terrestre tout entier sans jamais être déviés ou arrêtés. Grace aux études sur les neutrinos solaires, on avait déjà obtenu l'indication que leur masse est différente de zéro, bien que trop petite pour être déterminée avec les méthodes traditionnelles. Le nombre de neutrinos solaires qui arrivent jusqu'à la Terre est en effet inférieur aux prévisions faites sur la base de nos connaissances des réactions qui ont lieu à l'intérieur du soleil. Ce manque pourrait être dû à l'effet d'un phénomène d'*oscillation* qui fait que les neutrinos (qui existent sous trois formes: neutrino de l'électron, du muon et du tau) peuvent passer d'une forme à l'autre en échappant ainsi à nos détecteurs. Cependant, l'oscillation peut seulement avoir lieu si les différents types de neutrinos ont des masses différentes ce qui sera indirectement une preuve que leur masse n'est pas zéro. De CHORUS et NOMAD nous attendons peut-être le dernier mot sur l'existence de ce mécanisme de transformation. Les deux machines utilisent des neutrinos produits artificiellement dans un accélérateur

dans l'espoir de détecter leur oscillation d'une forme à l'autre. Ces expériences, qui ont débuté en 1994, s'achèveront en fin d'année. Mais pour connaître les résultats, nous devrons encore faire preuve de patience: seuls 10% des données ont été analysées et il y a de quoi espérer...

Mais la recherche ne connaît pas de temps mort et de nouveaux projets sont en chantier. TOSCA sera le nom de la machine étudiée pour prendre le mieux de CHORUS et NOMAD: elle devrait atteindre un sensibilité 10 fois plus grande. Et sont prêts à entrer en scène, ICARUS et OPERA, deux expériences fondées sur des techniques semblables à celles de CHORUS et NOMAD, mais sur une plus longue distance. Les faisceaux de neutrinos vont parcourir les centaines de kilomètres entre le CERN et le laboratoire italien du Grand Sasso. Ainsi les particules auront tout le temps pour se transformer... si elles en sont capables.

Vittorio Lega et Anna Meldolesi

L'enigma del neutrino

La massa dei neutrini. Un enigma da cui dipende la nostra concezione dell'universo e della struttura della materia. E che spera di ricevere una risposta definitiva da diversi esperimenti del CERN: CHORUS e NOMAD ormai in fase conclusiva, TOSCA, OPERA e ICARUS ancora in fase di progetto.

I neutrini sono le particelle più elusive: numerosissimi ma inafferrabili, interagiscono assai debolmente con la materia tanto che possono attraversare l'intero globo terrestre senza venire deviate o arrestate. Qualche indizio che la loro massa sia diversa da zero, anche se troppo piccola per essere determinata con i metodi tradizionali, era già stato raccolto grazie agli studi sui neutrini emessi dal Sole. Il numero di neutrini solari che arriva sulla Terra, infatti, risulta inferiore rispetto a quello previsto sulla base delle nostre conoscenze delle reazioni che avvengono all'interno del Sole. Questo deficit potrebbe essere l'effetto di un fenomeno di "oscillazione" per cui i neutrini, che si presentano nelle tre forme elettronica, muonica e tauonica, possono passare da una forma a un'altra sfuggendo così ai nostri rivelatori. L'oscillazione, tuttavia, può avvenire solo se i diversi tipi di

neutrino hanno masse differenti, e costituirebbe pertanto una prova indiretta del fatto che la loro massa non è nulla. Da CHORUS e NOMAD si aspetta una parola forse decisiva sulla reale esistenza di questo meccanismo di trasformazione. Entrambe le macchine utilizzano neutrini prodotti artificialmente in un accele-

ratore, nella speranza di rilevare la loro oscillazione da muonici in tauonici. Gli esperimenti, iniziati nel 1994, si concluderanno quest'anno. Ma per conoscere i risultati dovremo avere ancora un po' di pazienza: soltanto il 10% dei dati è stato analizzato e le aspettative non mancano.

Ma la ricerca non conosce tempi morti e nuovi progetti sono in cantiere. Si chiamerà TOSCA la macchina studiata per unire il meglio di CHORUS e NOMAD, che dovrebbe raggiungere una sensibilità dieci volte maggiore. E stanno per entrare in scena anche ICARUS e OPERA: due esperimenti che lavoreranno con tecniche simili a quelle di CHORUS e NOMAD ma su lunga distanza. I fasci di neutrini percorreranno le centinaia di chilometri che separano il CERN dal laboratorio italiano del Gran Sasso, dando alle particelle tutto il tempo di trasformarsi. Se ne sono capaci.

Vittorio Lega e Anna Meldolesi

SEMINARS SEMINAIRES

Pour de plus amples informations, prière de consulter
For full information on these seminars, please see
<http://wwwas.cern.ch/Bulletin/Seminars/current.html>

Monday 21 July

COSMOLOGY MEETING

at 14.00 hrs – TH Conference Room

Parametric resonance inflaton decay and supersymmetry

by Bruce CAMPBELL / University of Alberta,
Edmonton

Recently, analysis indicates that if the inflaton is coupled to bosonic decay fields with a coupling constant above $0(10^6)$, then post-inflationary reheating occurs by parametric resonance decay of the inflaton, leading to abrupt and efficient reheat. After reviewing the analyses that lead to this picture of inflaton decay, we discuss the modifications of this picture that occur if the decay product fields themselves display final-state self-interactions of moderate strength, such as gauge interactions. Finally, we discuss the challenges this presents for supersymmetric theories of nature, and in particular analyze the limits on parametric resonance decay which arise from limits on the cosmological production of gravitinos during reheat.

Monday 21 July

PPE SEMINAR

at 16.30 hrs – Auditorium*

Further evidence for neutrino oscillations from LSND: the $\nu_\mu \rightarrow \nu_e$ decay-in-flight channel

by Ion N. STANCU / University of California,
Riverside

A search for $\nu_\mu \rightarrow \nu_e$ oscillations has been conducted at the Los Alamos Meson Physics Facility using ν_μ from π^+ decay in flight. An excess in the number of beam-related events from the $\nu_e C \rightarrow e^- X$ inclusive reaction is observed. The excess is too large to be explained by normal ν_e contamination in the beam at a confidence level greater than 99%. If interpreted as an oscillation signal, the observed oscillation probability of $(2.6 \pm 1.0 \pm 0.5) \times 10^{-3}$ is consistent with the previously reported anti- $\nu_\mu \rightarrow$ anti- ν_e oscillation evidence from LSND.

*Tea & coffee will be served at 16.00 hrs.

Tuesday 22 July

IT TRAINING TUTORIAL

14.00-16.00 hrs – IT Auditorium, bld. 31/3-004

Basic Concepts in Object Oriented Programming

by Raul RAMOS-POLLAN / CERN-IT

This tutorial presents a simple explanation of the fundamental ideas behind the so-called Object Oriented Paradigm. With a general approach, it will provide you with the basic understanding to be able to think OO and learn OO languages and techniques. Aspects like maintenance and reuse of code, quality, and large projects design and implementation will be discussed within the OO framework, and some of the reasons behind such benefits will be outlined.

The talk will be general enough not to require any previous knowledge of any programming language but some insight in software development would be convenient. In the same way, the talk will give you the basics to learn any OO based methodology or language.

Tuesday 22 July

CERN PARTICLE PHYSICS SEMINAR

at 16.30 hrs – Auditorium*

Observation of threshold effects in J/psi production in Pb-Pb interactions at 158 GeV/c per nucleon

by Louis KLUBERG / Ecole Polytechnique, Palaiseau

Experiment NA50 studies the production of muon pairs from vector mesons, Drell-Yan and other processes in Pb-Pb interactions at the CERN SPS. It extends the search for Quark Gluon Plasma formation in nucleus-nucleus interactions started by experiment NA38 with lighter ion beams. The new results obtained by experiment NA50 from the most recent data confirm the "anomalous" J/psi suppression observed earlier. Moreover, these results show striking new features. The J/psi production rate is as expected from "normal" nuclear absorption for the most peripheral reactions but exhibits significant threshold effects when the centrality of the reaction increases.

*Tea & coffee will be served at 16.00 hrs.

Wednesday 23 July

THEORETICAL SEMINAR

at 14.00 hrs – TH Conference Room

Classical randomness and quantum determinism

by S. COLEMAN / Harvard

In the interpretation of quantum mechanics introduced by Everett (sometimes called the many-worlds interpretation), there is no probabilistic reduction of the wave function by measurements; the only dynamical process is strictly deterministic time evolution according to Schrödinger's equation. This makes it hard to understand how probability gets into quantum mechanics. This talk (based on work done with Andrew Lesniewski) will offer a resolution of this problem.

Thursday 24 July

LIBRARY SCIENCE TALKS 1997

at 10.00 hrs – TH Auditorium

Inside Physical Review Letters and the Electronic Publishing Frontier

by Robert GARISTO / Physical Review Letters

Western Europe now submits more papers to our journals than any other geographic region, including North America. I will explain how things work behind the scenes at Physical Review Letters, and show some interesting correspondence we have received for illustration. I will also discuss our electronic journals, other electronic projects, and future plans.

Friday 25 July

IT TRAINING TUTORIAL

10.00-12.00 hrs – IT Auditorium, bld. 31/3-004

C++ Techniques I

Understanding a Baroque Language

by Christoph VON PRAUN

The programming language C++ offers a variety of new features in addition to concepts it inherited from traditional C. For the C++ newbie, this overwhelming variety often leads to confusion and means a significant barrier to all those who want to start programming with C++.

The lecture demonstrates how conventional programming concepts of the procedural language C are seamlessly extended to make C++ an object-oriented language. The talk puts evidence on the fact that the understanding of basic C++ features is sufficient to follow an object-oriented programming paradigm with C++.

The knowledge of the programming language C eases the understanding of the talk.

Tuesday 29 July

IT TRAINING TUTORIAL

14.00-16.00 hrs – IT Auditorium, bld. 31/3-004

C++ Techniques II

Features of the new language standard

by Christoph VON PRAUN

Numerous features have been refined and added to the programming language C++ in recent years. The lecture presents an overview on the most significant innovations that the ANSI standardisation process has brought to C++. The following language features and their use are discussed in detail:

- The philosophy of Templates
- The structure and usage of the Standard Template Library (STL)
- C++ type casts
- The purpose and use of the Run Time Type Identification (RTTI)

Wednesday 30 July

EST-MF TECHNICAL SEMINAR

at 14.00 hrs - bld. 33, "Visits" Conference Room

Friction based processes for fabrication (Joining without melting !)

by Dave NICHOLAS / TWI , The Welding Institute, UK

TWI introduced friction welding to its Research Members as early as 1961. Today the process is applied in a wide range of industries from subsea to aerospace, and the Friction Welding Laboratory at TWI has expanded to include some 23 machines.

Dave Nicholas, a metallurgist by qualification, has led this development for 30 years. He was responsible for developing friction welding in hostile environments and introducing linear and orbital motion systems for joining non-round parts. In December 1991 his colleague, Wayne Thomas, invented the process of friction stir welding, which must be considered a major step change this century, in the joining of aluminium and its alloys in thickness from 1.2 mm up to 75 mm.

Dave Nicholas will present these processes and will specifically focus his attention on the method of friction stir welding in view of its potential application to fabricate structures needed for particle physics experiments. He will also take this opportunity to introduce TWI's services, facilities and other innovations such as low pressure electron beam, microjoining for electronics, and high power lasers. Where appropriate, selective videos will be used to complement his presentation.

The proposed agenda will therefore be :

- TWI - An Introduction
- Friction Welding - An Introduction
- Friction Based Processes - A Review
- Friction Stir Welding
- General Discussion.

Information: F. Bertinelli / 75098 or A. Desirelli / 78417

Thursday 31 July

SL SEMINAR

at 16.00 hrs – SL Auditorium, Prévessin, bld. 864

Functionality of the LEP tune meters based on DSP technology

by Karl-Dietmar LOHmann / CERN-SL

The LEP tune meters have been designed around 3rd generation DSPs. On-line signal processing is used for Fast Fourier Transforms, real time display of beam oscillations and numerical regulations. The resulting functionality for the control room and the performance are described in detail.

** Coffee and tea will be served at 15.30 hrs in front of the auditorium*

EDUCATION SERVICES EDUCATIFS



Information sur les cours, dates et places disponibles sur WWW:
Information about the courses, dates and places available on WWW :
<http://www.cern.ch/Training/>

SUMMER STUDENT LECTURES

<u>DATE</u>	<u>TIME</u>	<u>LECTURER</u>	<u>TITLE</u>
<i>Mon. 21 July</i>	09.15	M. Peskin	(SM-BSM) "Helicity as a Skeleton Key to Particle Physics" (2/11)
	10.15	M. Meddahi	Accelerators (2/7)
	11.15	P. Mato Vila	Trigger and Data Acquisition (1/3)
<i>Tue. 22 July</i>	09.15	M. Peskin	(SM-BSM) "Helicity as a Skeleton Key to Particle Physics" (3/11)
	10.15	M. Meddahi	Accelerators (3/7)
	11.15	P. Mato Vila	Trigger and Data Acquisition (2/3)
<i>Wed. 23 July</i>	09.15	M. W. Krasny	Deep Inelastic Lepton Scattering (1/3)
	10.15	M. Meddahi	Accelerators (4/7)
	11.15	P. Mato Vila	Trigger and Data Acquisition (3/3)
<i>Thu. 24 July</i>	09.15	M. W. Krasny	Deep Inelastic Lepton Scattering (2/3)
	10.15	M. Meddahi	Accelerators (5/7)
	11.15	M. Meddahi	Accelerators (6/7)
<i>Fri. 25 July</i>	09.15	M. W. Krasny	Deep Inelastic Lepton Scattering (3/3)
	10.15	_____	Seminar
	11.15	_____	Discussion Session
			Discussion Session

Next week

<i>Mon. 28 July</i>	09.15	M. Peskin	(SM-BSM) "Helicity as a Skeleton Key to Particle Physics" (4/11)
	10.15	M. Meddahi	Accelerators (7/7)
	11.15	R. Jacobsen	From Raw Data to Physics Results (1/3)
<i>Tue. 29 July</i>	09.15	M. Peskin	(SM-BSM) "Helicity as a Skeleton Key to Particle Physics" (5/11)
	10.15	R. Jacobsen	From Raw Data to Physics Results (2/3)
	11.15	R. Jacobsen	From Raw Data to Physics Results (3/3)
<i>Wed. 30 July</i>	09.15	M. Peskin	(SM-BSM) "Helicity as a Skeleton Key to Particle Physics" (6/11)
	10.15	K. Peach	CP Violation (+ Factories) (1/4)
	11.15	K. Peach	CP Violation (+ Factories) (2/4)
<i>Thu. 31 July</i>	09.15	M. Peskin	(SM-BSM) "Helicity as a Skeleton Key to Particle Physics" (7/11)
	10.15	L. Foà	LEP (1/3)
	11.15	L. Foà	LEP (2/3)
<i>Fri. 1 August</i>	09.15	L. Foà	LEP (3/3)
	10.15	_____	Discussion Session
	11.15	_____	Discussion Session

These lectures are prepared for Summer Students but they are open to everyone at CERN. Many of these lectures treat topics at a general level, and are therefore a good opportunity to brush up on subjects outside the scope of your daily work.
All lectures are given in English and held in the Auditorium. The complete programme is available on:
WWW: <http://www.cern.ch/CERN/Divisions/PE/HRS/Lectures>

Personnel Division

INFORMATIONS GÉNÉRALES GENERAL INFORMATION



DECES

Nous avons le regret d'annoncer le décès de M. André SONZOGNI, survenu le 12 juillet 1997.

M. André SONZOGNI, né le 14.03.39, travaillait à la Division EST. Il était au CERN depuis 1971.

Le Directeur Général a envoyé un message de condoléances à sa famille de la part du personnel du CERN

**Affaires sociales
Division du Personnel**

RESTAURANTS

Plats conventionnés (déjeuner) semaine du 21 juillet

Fixed price main courses (lunch) week of 21 July

	No 1 - COOP Bât. 501 - Site Meyrin	No 2 - DSR Bât. 504 - Site Meyrin	No 3 - Gén. de Rest. Bât. 866 - Site Préveressin	No 1 - COOP Bldg. 501 - Meyrin Site	No 2 - DSR Bldg. 504 - Meyrin Site	No 3 - Gén. de Rest. Bldg. 866 - Préveressin Site
Lundi-vendredi Samedi Dimanche	Heures d'ouverture: 07h00 - 01h00 Fermé sauf groupes Fermé Repas servis: 11h30-14h00 18h00-20h00 Prix (FF): a) 7.40 FF b) 8.70 FF	Heures d'ouverture: 06h30 - 18h00 Fermé Repas servis: 11h30-14h00 Prix (FF): a) 21.50 FF b) 25.00 FF	Heures d'ouverture: 07h00 - 18h00 Fermé Repas servis: 11h30-14h00 Prix (FF): a) 7.40 FF b) 8.70 FF	Opening times: 07h00 - 01h00 Closed except for groups Closed Meals served: 11h30-14h00 Prices (CHF): a) 7.40 CHF b) 8.70 CHF	Opening times: 06h30 - 18h00 Closed Meals served: 11h30-14h00 Prices (CHF): a) 7.60 CHF b) 8.70 CHF	Opening times: 07h00 - 18h00 Closed Meals served: 11h30-14h00 Prices (CHF): a) 21.50 CHF b) 25.00 CHF
Lundi	a) Cuisse de poulet aux champignons Riz Pois mangétout b) Sauté de bœuf aux poivrons Graines de couscous	a) Spaghetti au beurre al arrabiata - Salade verte b) Émincé de porc aux légumes croquants Riz thaï Légumes chinois TOUS LES JOURS GRILLADES SUR LA TERRASSE	a) Saumonette provençale b) Croûte des montagnes Pommes frites Carottes ENTRECÔTE GRILLÉE	Monday a) Chicken leg with mushrooms Rice Snow peas b) Beef stew with sweet peppers Couscous	Monday a) Buttered spaghetti with "Arrabiata" sauce Green salad b) Pork stew with vegetables - Thai rice Chinese vegetables EVERY DAY GRILLED MEAT ON TERRACE	a) Provençal-style rock salmon b) Mountain-style Toast Green salad French fried potatoes Carrots GRILLED SIRLOIN STEAK
Mardi	a) Émincé de foie de bœuf Riz Petits pois b) Filet de pâté pané Pommes nature Tomate aux herbes	a) Anneaux de clams à la romaine sauce tartare Légumes d'été Salade verte b) Piccata de dinde sauce provençale Nouilles au basilic Ratatouille niçoise	a) Tourte fribourgeoise b) Bœuf sauté au paprika Riz Choux-fleurs	Tuesday a) Sliced beef liver Rice Peas b) Breaded fillet of plaice Boiled potatoes Tomato with fine herbs	a) Rome-style squids with tartar sauce Summer vegetables Green salad b) Provençal-style turkey "Piccata" Pasta with basil Ratatouille	a) Freiburg-style pancake b) Beef stew with paprika Rice Cauliflower
Mercredi	a) Steak de bœuf haché Pommes rissolées Carottes Vichy b) Rôti de veau Spirlettes Fenouil	a) Fricassée de foie de volaille à l'ancienne Pâtes au beurre Salade verte b) Brochettes mixé grill sauce barbecue Pommes rissolées Carottes Vichy	a) Filet de colin Duglére b) Carré de porc Pâtes Lentilles Jardinière de légumes GRILLADES	Wednesday a) Minced beef steak Sautéed potatoes Vichy carrots b) Roast veal Pasta Fennel	a) Fricasséed chicken liver Buttered pasta Green salad b) Mixed grill with barbecue sauce Sautéed potatoes Vichy carrots	a) Fillet of hake "Duglére" b) Pork chop Pasta Lentils Diced vegetables MIXED GRILL
Jeudi	a) Paupiette de volaille Nouillettes Épinards b) Émincé de porc au curry Riz Courgettes	a) Hachis Parmentier Salade verte b) Coquelet grillé aux herbes Riz safrané Haricots verts	a) Saucisse fumée au chou madère Gratin de pommes de terre au fromage Fenouil braisé FAVE DE BCEUF	Thursday a) Stuffed chicken slice Pasta Spinach b) Curried veal stew Rice Courgettes	a) Cottage pie Green salad b) Grilled chicken with fine herbs Rice with saffron Green beans	a) Sausage with cabbage sauce b) Sliced beef kidneys with madeira sauce Baked sliced potatoes with cheese & cream Braised fennel GRILLED SIRLOIN STEAK
Vendredi	a) Saucisse à rôtir Pommes frites Baby carottes b) Filet de daurade Pommes nature Brocoli	a) Croque monsieur Salade verte b) Pavé de saumon rôti beurre au citron Pommes vapeur Petits pois et maïs	a) Filet de truite à la moutarde Épaule d'agneau rôti Pommes purée Haricots verts Tomate grillée STEAK HACHÉ ŒUF À CHEVAL	Friday a) Roast sausage French fried potatoes Baby carrots b) Fillet of sea bream Boiled potatoes Broccoli	a) Ham & cheese on toast Green salad b) Roast salmon with buttered & lemon sauce Boiled potatoes Peas & corn	a) Fillet of trout with mustard sauce b) Roast shoulder of lamb Mashed potatoes Green beans Grilled tomato MINCED BEEF STEAK WITH EGG

INFORMATION

Les informations paraissant sous cette rubrique sont publiées sous la seule responsabilité de l'Association du personnel du CERN.

The information presented under this heading is published under the sole responsibility of the CERN Staff Association.

Association
du personnel
CERN

Staff
association
CERN

STAFF_ASSOCIATION@MACMAIL.CERN.CH

Adresse AP sur le WEB

<http://www-staff-assoc.cern.ch/>

Notre collègue André Sonzongni de la Division EST est décédé subitement le week-end dernier.

Il est entré au CERN en 1971 à l'âge de 32 ans comme mécanicien et il a donc fêté ses 25 ans au CERN en 1996.

André a été très actif au sein de l'Association du personnel: d'abord comme délégué au Conseil du personnel de 1985 à 1991 et ensuite, depuis 1993, comme membre de la Commission électorale. Dans ce cadre, il a assisté en juin dernier au dépouillement des bulletins de vote lors des élections au Conseil du personnel. Un message de condoléances a été envoyé à sa famille de la part de ses collègues à l'Association du personnel, très affectés par sa disparition.

CLUBS



Le Club Automobile, pour son quarantième anniversaire, organise le 21 septembre prochain un **rallye familial** ouvert à tous.

Le rallye se déroulera dans le Jura Gessien sur un parcours d'environ 60 Km; il sera animé par des jeux et des questions tout au long du circuit ainsi qu'au poste de contrôle et le midi au restaurant.

Le repas de midi est prévu au restaurant, bien connu, Le FARTORET à Eloise, en France et sera offert par notre Club (sauf boissons).

On demandera à chaque participant, à l'inscription, une somme de 15 CHF pour les adultes et 8 CHF pour les enfants de moins de 12 ans.

Le rallye commencera dimanche matin autour de 9 heures et la remise des prix s'effectuera au restaurant de la COOP du CERN vers 18 heures (apéritif offert). Pour des raisons d'organisation on limitera le nombre total des véhicules à environ 30 et dès maintenant, si vous êtes intéressés nous vous demandons une pré-inscription, qu'on vous demandera de confirmer fin août.

Nous vous invitons à participer nombreux à cette manifestation qui, dans le contexte de notre anniversaire, sera exceptionnelle.

PRE-INSCRIPTION RALLYE

Nom: Prénom:

Div. Tél.

Nombre de personnes d'équipage:

Enfants:

SVP Veuillez retourner ce coupon à:
C. Dechelette/ECP ou C. Zanaschi/EST

CRICKET

CERN C.C. versus Bern CC on July 13th, 1997

CERN entertained Bern CC in a friendly match at the SPS ground. After great difficulty getting the opposing team into Lab 2, CERN then had even more trouble in the field trying to get the opposition out. On a baking hot day, Bern had the good fortune to win the toss and elect to bat. They then proceeded to bat as if there was no tomorrow, sixes being smashed far too frequently for CERN's liking. The Bern opening bat, Tissa, continued where he left off the last time in Bern, hitting another century, this time 164. Bern reached the formidable total of 269 for 8 off their 40 overs. Goodyear ended up with the best bowling figures, taking 4 for 34 off his 8 overs. CERN's batting then proved to be as fragile as ever and, with opener Dean (averaging 76 before this game) not troubling the scorers, were soon in deep trouble at 11 for 6 and the chances of beating the record for the lowest ever score (14, against Bern) were looking quite high. Fortunately, with the help of a Bern player, Gooda, who kindly offered to play for CERN to make up the eleven, the score gradually increased until CERN were finally all out for 56 in the 25th over, with Gooda top scorer on 26. This heavy defeat, by 213 runs, continued CERN's dismal record for the season, and, unless new players are found soon, the future of the club looks very doubtful.

CERN's next fixtures are on Sunday, July 20th away at Cossonay and on Saturday/Sunday, July 27-28th at home to Milan.

Further information about Cricket can be found on the World Wide Web:
<http://ecponion.cern.ch/cricket/welcome.html>, or from:

D.J. Allen (73569 David.John.Allen@cern.ch)
W. Salter (72162 Wayne.Salter@cern.ch)
B. Pattison (72923 Bryan.Pattison@cern.ch)
C. Onions (75039 Christopher.Onions@cern.ch).

New members are more than welcome!



CROQUET

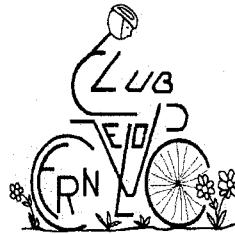
The Swiss team of Peter Payne, Ian Sexton, Norman Eatough and Dave Underhill recently enjoyed **an extended tour of the U.K.**, playing national selections of players whose aggregate handicaps were somewhat stronger than ours. We won 12–8 against England in Cheltenham, and fitted in a trip down a recently-closed Welsh coal mine en route to our match against a much stronger Welsh team, whom we were trailing 5–10 when the match had to be abandoned after torrential rain flooded parts of the lawns. In Glasgow we enjoyed dry, warm weather, and narrowly lost 7–6. The courts were marked out on two bowling greens, which needless to say it was a real pleasure to play on. The following weekend we played **France** in the Vendée, notching up a resounding 14–6 win. Dave Underhill was unavailable, so he was replaced one day by Will Howell and the other by 14 year-old Mark Conway, part of our Juniors' policy, who played confidently in his very first international.

We were royally wined and dined wherever we went, the home teams now matching the standard set over here (accommodation with players' families, lunches at the clubhouse and dinner at quality restaurants). There are now challenge cups for these internationals and competition for selection to play in Switzerland next year is definitely hotting up.

The Swiss championships are now going through their preliminary rounds on our lawns on the Prévessin site, with the Handicap semis and finals taking place all day on **Saturday 19th and Sunday 20th July**. Spectators are welcome; the games will be explained live.

The club is looking for new members to take up this fascinating skilful sport. The club organises internal tournaments, the Swiss championships and provides the members of the **Swiss team**, which plays France, Italy, England, Scotland, Ireland, Wales, Jersey and Belgium. *You could be part of this!*

For further information on the game, **including free introductory lessons, please contact Ian Sexton (75797) or Norman Eatough (04 50 41 21 87).**



Avec les longues journées bien agréables, venez rouler avec nous, même si vous n'êtes pas (encore) membre de notre Club. Nous partons aussi tous les mercredis soir à 18h00 pour un entraînement adapté à chacun et à chacune...

Vélo de route

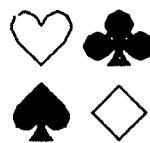
Samedi **19 Juillet**, nous vous proposons "Le Tour du Mont Salève", sur 76 km. La dénivellation totale est de 667 mètres. Départ à **13h00** sur le **Parking des Drapeaux** à l'entrée du CERN.

Samedi **26 Juillet**, venez découvrir avec nous sur 82 km assez faciles, un bout du Jura Sauvage, autour de la Forêt de la Haute Joux et la Forêt du Mont Noir, derrière Morez. Rendez-vous à **10h30** au parking en haut du **Col de la Savine**. Et n'oubliez pas d'amener votre pique-nique!

VTT

Dimanche **20 Juillet**, nous vous invitons à une sortie de type familiale vers le Lac de Vouglans, sur environ 20 km. Départ à **9h00** à la **Gare de Gex**. Encore une fois, prévoyez un pique-nique dans votre musette et, s'il fait beau, votre maillot de bain!

Certains magasins de sport accordent des réductions de prix intéressantes si vous présentez votre carte de membre. Profitez-en en ce début des vacances!



CERN BRIDGE

The next tournament will be held on Wednesday 23 July, Building 504. Please inscribe by 7.45 p.m.

Last week's tournament winners were:

North/South

- | | |
|---------------------------------------|-------|
| 1. Marcin Nowak & Aneta Baran | 66.1% |
| 2. Marie-France Lumley & Betty Appelo | 56.4% |
| 3. Paul Samson & Dave Stieber | 56.2% |

East / West

- | | |
|--|-------|
| 1. Barbara Perkins & Rafael Di Grazzia | 62.0% |
| 2. Nikolai Smirnov & Igor Semeniouk | 59.8% |
| 3. Alan Lumley & Philippa McCormak | 56.8% |

Saturday
Samedi

19

July
Juillet

17h

Restaurant 1

Tomorrow!
Demain!

VIII

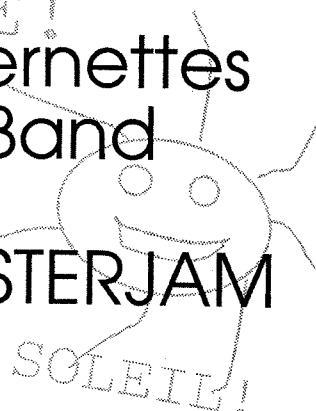
CERN Hardronic Festival

DANCE!

MUSIC!

- 5:30pm Classical Music
- 6:00pm Tony "Lone Ranger" Arnold
- 7:00pm Lemon & McParty
- 7:30pm A Summer Spice Show
- 8:30pm SMC2 BOOZE!
- 9:30pm Les Horribles Cernettes
- 10:30pm Bedrock Blues Band
- 11:30pm Crosstalk
- 12:30pm SURPRISE MONSTERJAM

ET
ET
ET
ET
ET



CINE-CLUB CERN

JEUDI 24 JUILLET 1997, à 20h30

THURSDAY 24 JULY 1997, at 8.30 p.m.

Amphithéâtre Bâtiment Principal / Main Auditorium

Frankenstein

de / of K. Branagh

Avec / with K. Branagh, Robert de Niro

Dès les premières secondes la beauté est là: ce vaisseau blanc pareil à un fantôme emprisonné dans les glaces. Scène extraordinaire, bien plus envoûtante que celle que (Mary Shelley nous pardonnera) qu'elle avait imaginé pour son livre en 1818.

C'est le talent de K. Branagh de prendre Shakespeare ou Mary Shelley à bras le corps, les vivifier tout en demeurant fidèle à l'esprit et non à la lettre. Grâce à K. Branagh la créature devient un personnage superbe interprété avec sobriété par Robert De Niro, c'est une victime du destin condamné au mal alors qu'elle aimeraient pencher du côté du bien.

De Niro est à l'image du film: terrible et bouleversant.

Right from the start there is beauty: the white vessel like a ghost imprisoned in the ice is an extraordinary scene more haunting than the one Mary Shelley (she will forgive us) had imagined for her book in 1818.

K. Branagh's talent to grapple with Shakespeare or Mary Shelley, and to invigorate them whilst remaining faithful to the spirit, if not the text, is sheer genius. Thanks to him the "creature" becomes a person superbly interpreted by Robert De Niro, a victim of destiny, condemned to evil when he would so like to be on the side of good.

De Niro is the embodiment of this fearful and disturbing film.

**Version originale Anglais sous-titrée Français-Allemand
English dialogue with French and German sub-titles**

Entrée/Entrance: 8 CHF

COOPÉRATIVES

COOPIN

(Bât. 563)

Heures d'ouverture du magasin:
du lundi au vendredi de 13h00 à
16h30
tel : 72864 – 73637
fax : 782 07 70



(Bât. 563)

Rayons: parfumerie, droguerie, alimentation, vin, tabac, calculatrice, horlogerie, bijouterie, photo, jouet, textile, jumelles, cassette...

En stock

Films KODAK, Kodachrome, Ektachrome Elite, Advantix, KODAK Gold.

Rasoirs à jeter BIC.

Chronomètres CASIO premier prix CHF 31.60.

Réveil radio piloté Hotline HL 212 CHF 44.-.

Bijoux en or 18 kt.

Nouveau choix de montres.

Choix de couteaux suisses.

Eaux minérales, Coca-Cola, Ice Tea, etc.

Sachet de gingembre.

MARCHÉS VOYAGES

1. avec SUNTUR – MÔLE nous vous proposons au départ de GENÈVE, en francs français, des voyages culturels et des circuits longs courriers, avec guides francophones, en collaboration avec les meilleurs voyagistes:

- Jet Tours
- Starter
- Hôtel Plan
- Kuoni France et Suisse
- Cartour – Tourmonde
- Vacances Air Transat
- Planète
- Ailleurs – Guillermain, etc.

Renseignements et inscriptions à SUNTUR VOYAGES à Ferney, Bellegarde, Saint-Genis, Cluses, Thonon et à MÔLE VACANCES à Annemasse, Cluses, Douvaine, Saint-Julien, Viuz-en-Sallaz.

Permanence spéciale avec Blandine à Ferney le jeudi de 16h00 à 18h30 ou sur rendez-vous dans les différentes agences.

2. avec CLIO vous avez des voyages culturels de haut niveau dans le monde entier au départ de Paris ou Lyon et pour certains de Genève.

Renseignements et inscriptions à Explor'action CLIO à Genève.

Des conditions particulières vous sont accordées et le meilleur accueil vous sera réservé par nos deux prestataires.

Calendrier hebdomadaire

1997

Weekly Calendar

Lundi Monday	21.7	Mardi Tuesday	22.7	Mercredi Wednesday	23.7	Jeudi Thursday	24.7	Vendredi Friday	25.7
09.15 A	09.15 SUMMER STUDENT LECTURE (SM-BSM) "Helicity as a Skeleton Key to Particle Physics" (3/11) M. Peskin Accelerators (3/7)	09.15 SUMMER STUDENT LECTURE (SM-BSM) "Helicity as a Skeleton Key to Particle Physics" (3/11) M. Peskin Accelerators (2/11)	09.15 SUMMER STUDENT LECTURE (SM-BSM) "Helicity as a Skeleton Key to Particle Physics" (4/11) M. Peskin Accelerators (2/7)	09.15 SUMMER STUDENT LECTURE Deep Inelastic Lepton Scattering (1/3) A M. W. Krasny Accelerators (4/7)	09.15 SUMMER STUDENT LECTURE Deep Inelastic Lepton Scattering (2/3) A M. W. Krasny Accelerators (5/7)	09.15 SUMMER STUDENT LECTURE Deep Inelastic Lepton Scattering (3/3) A M. W. Krasny Accelerators (6/7)	09.15 SUMMER STUDENT LECTURE Deep Inelastic Lepton Scattering (2/3) A M. W. Krasny Accelerators (5/7)	09.15 SUMMER STUDENT LECTURE Deep Inelastic Lepton Scattering (3/3) A M. W. Krasny Accelerators (6/7)	09.15 SUMMER STUDENT LECTURE Deep Inelastic Lepton Scattering (2/3) A M. W. Krasny Accelerators (5/7)
10.15	10.15 M. Meddahi Trigger and Data Acquisition (2/3) P. Mato Vila	10.15 M. Meddahi Trigger and Data Acquisition (2/3) P. Mato Vila	10.15 M. Meddahi Trigger and Data Acquisition (2/3) P. Mato Vila	10.15 M. Meddahi Trigger and Data Acquisition (2/3) P. Mato Vila	10.15 M. Meddahi Trigger and Data Acquisition (3/3) P. Mato Vila	10.15 M. Meddahi Trigger and Data Acquisition (3/3) P. Mato Vila	10.15 M. Meddahi Trigger and Data Acquisition (3/3) P. Mato Vila	10.15 M. Meddahi Trigger and Data Acquisition (3/3) P. Mato Vila	10.15 M. Meddahi Trigger and Data Acquisition (3/3) P. Mato Vila
11.15	11.15 M. Meddahi Trigger and Data Acquisition (1/3) P. Mato Vila	11.15 M. Meddahi Trigger and Data Acquisition (1/3) P. Mato Vila	11.15 M. Meddahi Trigger and Data Acquisition (1/3) P. Mato Vila	11.15 M. Meddahi Trigger and Data Acquisition (1/3) P. Mato Vila	11.15 M. Meddahi Trigger and Data Acquisition (1/3) P. Mato Vila	11.15 M. Meddahi Trigger and Data Acquisition (1/3) P. Mato Vila	11.15 M. Meddahi Trigger and Data Acquisition (1/3) P. Mato Vila	11.15 M. Meddahi Trigger and Data Acquisition (1/3) P. Mato Vila	11.15 M. Meddahi Trigger and Data Acquisition (1/3) P. Mato Vila
14.00 TH	14.00 COSMOLOGY MEETING Parametric resonance inflation decay and supersymmetry by Bruce CAMPBELL / University of Alberta, Edmonton	14.00 IT TRAINING TUTORIAL Basic Concepts in Object Oriented Programming by Raul RAMOS-POLLAN / CERN-IT	14.00 IT TRAINING TUTORIAL Basic Concepts in Object Oriented Programming by Raul RAMOS-POLLAN / CERN-IT	14.00 THEORETICAL SEMINAR Classical randomness and quantum determinism by S. COLEMAN / Harvard	14.00 THEORETICAL SEMINAR Classical randomness and quantum determinism by S. COLEMAN / Harvard	14.00 THEORETICAL SEMINAR Classical randomness and quantum determinism by S. COLEMAN / Harvard	14.00 THEORETICAL SEMINAR Classical randomness and quantum determinism by S. COLEMAN / Harvard	14.00 THEORETICAL SEMINAR Classical randomness and quantum determinism by S. COLEMAN / Harvard	14.00 THEORETICAL SEMINAR Classical randomness and quantum determinism by S. COLEMAN / Harvard
16.30 A	16.30 PPE SEMINAR Further evidence for neutrino oscillations from LSND : the $\nu_\mu \rightarrow \nu_e$ decay-in-flight channel by Ian N. STANCU / University of California, Riverside	16.30 CERN PARTICLE PHYSICS SEMINAR Observation of threshold effects in J/\psi production in Pb-Pb interactions at 158 GeV/c per nucleon by Louis KLUBERG / Ecole Polytechnique, Palaiseau	16.30 CERN PARTICLE PHYSICS SEMINAR Observation of threshold effects in J/\psi production in Pb-Pb interactions at 158 GeV/c per nucleon by Louis KLUBERG / Ecole Polytechnique, Palaiseau	28.7	29.7	30.7	31.7	31.7	31.7
09.15 A	09.15 SUMMER STUDENT LECTURE (SM-BSM) "Helicity as a Skeleton Key to Particle Physics" (4/11) M. Peskin Accelerators (7/7)	09.15 SUMMER STUDENT LECTURE (SM-BSM) "Helicity as a Skeleton Key to Particle Physics" (5/11) M. Peskin From Raw Data to Physics Results (2/3)	09.15 SUMMER STUDENT LECTURE (SM-BSM) "Helicity as a Skeleton Key to Particle Physics" (6/11) M. Peskin From Raw Data to Physics Results (2/3)	09.15 SUMMER STUDENT LECTURE (SM-BSM) "Helicity as a Skeleton Key to Particle Physics" (7/11) M. Peskin From Raw Data to Physics Results (3/3)	09.15 SUMMER STUDENT LECTURE (SM-BSM) "Helicity as a Skeleton Key to Particle Physics" (8/11) M. Peskin From Raw Data to Physics Results (4/4)	09.15 SUMMER STUDENT LECTURE (SM-BSM) "Helicity as a Skeleton Key to Particle Physics" (9/11) M. Peskin From Raw Data to Physics Results (4/4)	09.15 SUMMER STUDENT LECTURE (SM-BSM) "Helicity as a Skeleton Key to Particle Physics" (10/11) M. Peskin From Raw Data to Physics Results (4/4)	09.15 SUMMER STUDENT LECTURE (SM-BSM) "Helicity as a Skeleton Key to Particle Physics" (11/11) M. Peskin From Raw Data to Physics Results (4/4)	09.15 SUMMER STUDENT LECTURE (SM-BSM) "Helicity as a Skeleton Key to Particle Physics" (12/11) M. Peskin From Raw Data to Physics Results (4/4)
10.15	10.15 M. Meddahi From Raw Data to Physics Results (1/3) R. Jacobsen	10.15 M. Meddahi From Raw Data to Physics Results (1/3) R. Jacobsen	10.15 M. Meddahi From Raw Data to Physics Results (1/3) R. Jacobsen	10.15 M. Meddahi From Raw Data to Physics Results (1/3) R. Jacobsen	10.15 M. Meddahi From Raw Data to Physics Results (1/3) R. Jacobsen	10.15 M. Meddahi From Raw Data to Physics Results (1/3) R. Jacobsen	10.15 M. Meddahi From Raw Data to Physics Results (1/3) R. Jacobsen	10.15 M. Meddahi From Raw Data to Physics Results (1/3) R. Jacobsen	10.15 M. Meddahi From Raw Data to Physics Results (1/3) R. Jacobsen
11.15	11.15 M. Meddahi From Raw Data to Physics Results (1/3) R. Jacobsen	11.15 M. Meddahi From Raw Data to Physics Results (1/3) R. Jacobsen	11.15 M. Meddahi From Raw Data to Physics Results (1/3) R. Jacobsen	11.15 M. Meddahi From Raw Data to Physics Results (1/3) R. Jacobsen	11.15 M. Meddahi From Raw Data to Physics Results (1/3) R. Jacobsen	11.15 M. Meddahi From Raw Data to Physics Results (1/3) R. Jacobsen	11.15 M. Meddahi From Raw Data to Physics Results (1/3) R. Jacobsen	11.15 M. Meddahi From Raw Data to Physics Results (1/3) R. Jacobsen	11.15 M. Meddahi From Raw Data to Physics Results (1/3) R. Jacobsen
14.00 IT*	14.00 IT TRAINING TUTORIAL C++ Techniques II - Features of the new language standard by Christoph VON PRAUN	14.00 EST-MF TECHNICAL SEMINAR Friction based processes for fabrication (Joining without melting !) by Dave NICHOLAS / TWI, The Welding Institute, UK bld. 33 ("Visits" Conference Room)	14.00 EST-MF TECHNICAL SEMINAR Friction based processes for fabrication (Joining without melting !) by Dave NICHOLAS / TWI, The Welding Institute, UK bld. 33 ("Visits" Conference Room)	14.00 EST-MF TECHNICAL SEMINAR Friction based processes for fabrication (Joining without melting !) by Dave NICHOLAS / TWI, The Welding Institute, UK bld. 33 ("Visits" Conference Room)	14.00 EST-MF TECHNICAL SEMINAR Friction based processes for fabrication (Joining without melting !) by Dave NICHOLAS / TWI, The Welding Institute, UK bld. 33 ("Visits" Conference Room)	14.00 EST-MF TECHNICAL SEMINAR Friction based processes for fabrication (Joining without melting !) by Dave NICHOLAS / TWI, The Welding Institute, UK bld. 33 ("Visits" Conference Room)	14.00 EST-MF TECHNICAL SEMINAR Friction based processes for fabrication (Joining without melting !) by Dave NICHOLAS / TWI, The Welding Institute, UK bld. 33 ("Visits" Conference Room)	14.00 EST-MF TECHNICAL SEMINAR Friction based processes for fabrication (Joining without melting !) by Dave NICHOLAS / TWI, The Welding Institute, UK bld. 33 ("Visits" Conference Room)	14.00 EST-MF TECHNICAL SEMINAR Friction based processes for fabrication (Joining without melting !) by Dave NICHOLAS / TWI, The Welding Institute, UK bld. 33 ("Visits" Conference Room)
16.00 SL	16.00 SL SEMINAR Functionality of the LEP tune meters based on DSP technology by Karl-Dietmar LOHMAN / CERN-SL	16.00 SL SEMINAR Functionality of the LEP tune meters based on DSP technology by Karl-Dietmar LOHMAN / CERN-SL	16.00 SL SEMINAR Functionality of the LEP tune meters based on DSP technology by Karl-Dietmar LOHMAN / CERN-SL	16.00 SL SEMINAR Functionality of the LEP tune meters based on DSP technology by Karl-Dietmar LOHMAN / CERN-SL	16.00 SL SEMINAR Functionality of the LEP tune meters based on DSP technology by Karl-Dietmar LOHMAN / CERN-SL	16.00 SL SEMINAR Functionality of the LEP tune meters based on DSP technology by Karl-Dietmar LOHMAN / CERN-SL	16.00 SL SEMINAR Functionality of the LEP tune meters based on DSP technology by Karl-Dietmar LOHMAN / CERN-SL	16.00 SL SEMINAR Functionality of the LEP tune meters based on DSP technology by Karl-Dietmar LOHMAN / CERN-SL	16.00 SL SEMINAR Functionality of the LEP tune meters based on DSP technology by Karl-Dietmar LOHMAN / CERN-SL
TH	TH Theory Conference Room / bld. 4 Salle Théorie /bât. 4	DG 6th Floor Conference Room, bld. 60 Salle de conférence du 6 ^e étage, bld. 60	M Microcosm Conference Room, bld. 33/R-09 Salle de Conférence Microcosm, bld. 33/R-09	LHC LHC Auditorium / bld. 30, 7 ^e étage Amphithéâtre LHC / bld. 30, 7 ^e étage	PS PS Auditorium / bld. 6, 2 nd floor Amphithéâtre PS / bld. 6, 2 nd floor	DG 6th Floor Conference Room, bld. 60 Salle de conférence du 6 ^e étage, bld. 60	M Microcosm Conference Room, bld. 33/R-09 Salle de Conférence Microcosm, bld. 33/R-09	LHC LHC Auditorium / bld. 30, 7 ^e étage Amphithéâtre LHC / bld. 30, 7 ^e étage	PS PS Auditorium / bld. 6, 2 nd floor Amphithéâtre PS / bld. 6, 2 nd floor

A Auditorium / bld. 500
Amphithéâtre / bld. 500

C Council Chamber / bld. 503
Salle du Conseil / bld. 503

TH Theory Conference Room / bld. 4
Salle Théorie /bât. 4

LHC LHC Auditorium / bld. 30, 7^e étage
Amphithéâtre LHC / bld. 30, 7^e étage

DG 6th Floor Conference Room, bld. 60
Salle de conférence du 6^e étage, bld. 60

M Microcosm Conference Room, bld. 33/R-09
Salle de Conférence Microcosm, bld. 33/R-09

PS PS Auditorium / bld. 6, 2nd floor
Amphithéâtre PS / bld. 6, 2nd floor

SL SL Amphithéâtre SL / bld. 33, 1^{er} ét.
Salle de conférence SL / bld. 33, 1^{er} ét.

IT* IT Auditorium - bld. 31/3-004 & 5
Amphithéâtre IT - bld. 31/3-004 & 5
Formerly CN

E ECP Conference Room, bld. 13/2-005
Salle de conférence ECP, bld. 13/2-005

► place as indicated
lieu selon indication

Deadline for insertion : Tuesday 12.00 hrs
Media & Publications (PSU) : bld. 64/R-002, tel. 7819
e-mail : weekly_bulletin@muacmail

Dernier délai pour inserions : mardi 12.00 h
Association du Personnel : bld. 64/R-002, tel. 72819
Media & Publications (PSU) : bld. 50/1-034, tel. 73475
e-mail : staff_association@muacmail