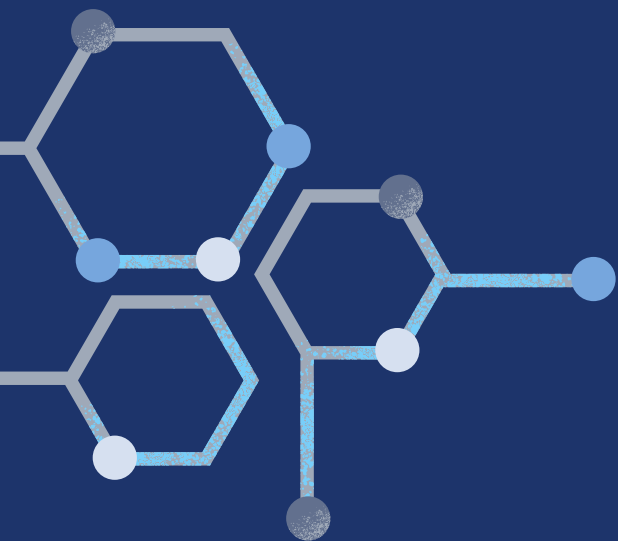
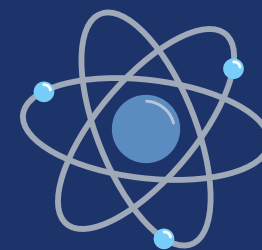




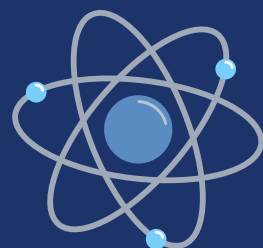
$$E=mc^2$$



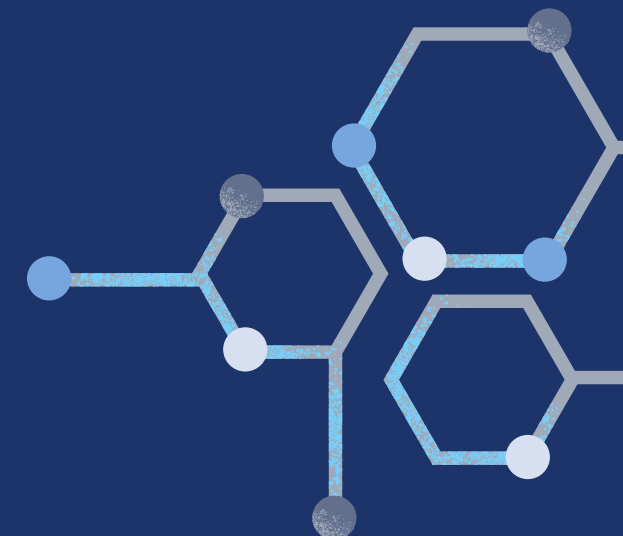
SINXROTRON NURLANISHI VA UNING QO'LLANILISHI



Bajardi:Inomova G,Mirzaqulova M
Tekshirdi:Xoshimjonov X

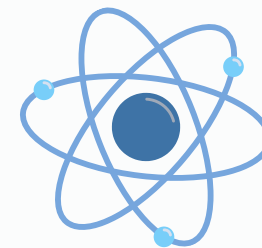


$$E_k=\frac{1}{2}mv^2$$



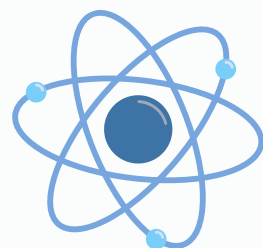
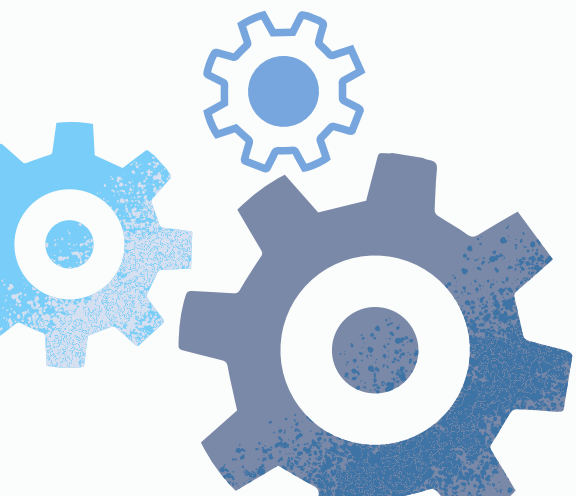


$$E = m \cdot c^2$$

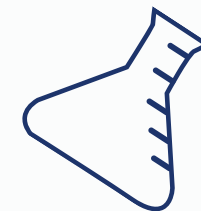


REJA:

1. Sinxrotron nurlanishining kashf etilishi va fizik mohiyati
2. Sinxrotron qurilmasining tuzilishi va ishlash prinsipi
3. Sinxrotron nurlanishining afzalliklari va kamchiliklari
4. Xulosa
5. Foydalanilgan adabiyotlar

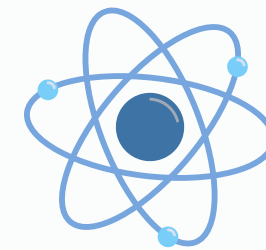


$$E_k = \frac{1}{2}mv^2$$





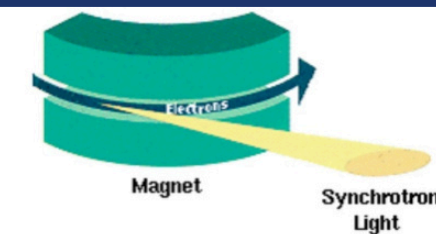
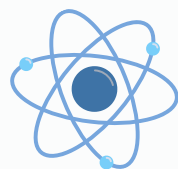
$$E=mc^2$$



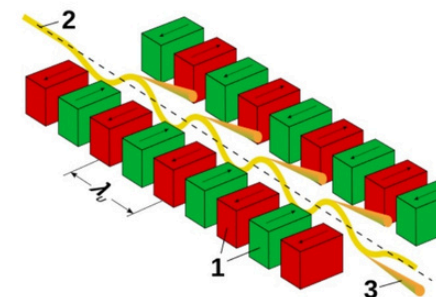
1. SINXROTRON NURLANISHI HAQIDA TUSHUNCHA

Sinxrotron nurlanishi relyativistik zaryadlangan zarralar tezligiga perpendikulyar tezlanishga ($a \perp v$) ta'sir qilganda chiqariladigan elektromagnit nurlanishdir. U sun'iy ravishda zarracha tezlatgichlarining ayrim turlarida yoki tabiiy ravishda magnit maydonlar bo'ylab harakatlanadigan tez elektronlar tomonidan ishlab chiqariladi. Shu tarzda ishlab chiqarilgan radiatsiya xarakterli polarizasyona ega va hosil bo'lgan chastotalar elektromagnit spektrning katta qismida o'zgarishi mumkin. Sinxrotron nurlanish mexanizmi astrofizikada ko'p uchraydigan effekt hisoblanadi. Ular sharoit bo'lgan hamma joyda uchraydi.

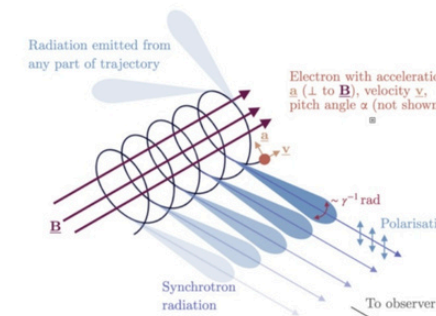
$$E_k = \frac{1}{2}mv^2$$



Eguvchi magnitdan sinxrotron nurlanishi



Dalgalanuvchidan sinxrotron nurlanishi

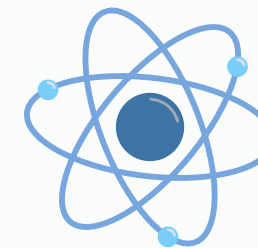


Astronomik manbadan olingan sinxrotron



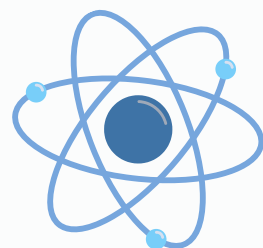
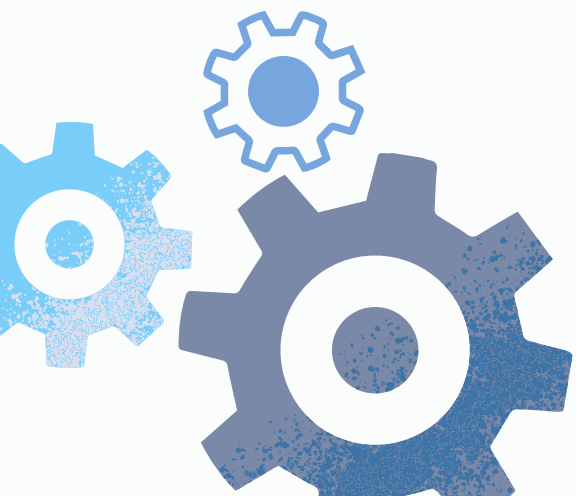


$$E=m.c^2$$



KASHF ETILISHI

Sinxrotron nurlanishi — bu yuqori tezlikda harakatlanayotgan zaryadlangan zarrachalar magnit maydoni taʼsirida spiral trajektoriyada harakatlanib, nurlanish chiqaradigan fizik hodisadir. Sinxrotron nurlanishining kashf etilishi 1947-yilda Amerika Qoʻshma Shtatlaridagi General Electric kompaniyasining laboratoriyasida sodir boʻlgan. Bu kashfiyot tasodifan, zarrachalar elektr maydonida tezlashishi natijasida ortiqcha energiya chiqarishi orqali yuzaga kelgan. Bu hodisa fiziklar tomonidan qayd etilib, birinchi marta sinxrotron qurilmasi yaratildi.

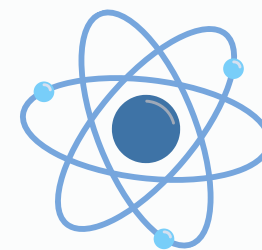


$$E_k = \frac{1}{2}mv^2$$





$$E=m.c^2$$



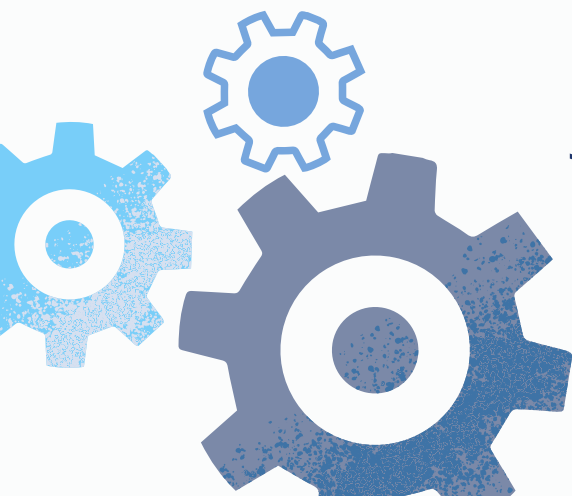
2.SINXROTRON QURILMASINING TUZILISHI VA ISHLASH PRINSIPI



Sinxrotron keng ko'lamli ob'ektlarni qurishni ta'minlaydigan birinchi tezlatkich kontseptsiyalaridan biridir, chunki qurilma yordamida nurni fokuslash va tezlashtirishni turli qismlarga ajratish mumkin. Eng kuchli zamonaviy zarracha tezlatgichlari sinxrotron dizayni versiyalaridan foydalanib quriladi. Eng katta sinxrotron turidagi tezlatkich, shuningdek, dunyodagi eng katta zarracha tezlatgichi, 27-kilometr-circumference (17 mi) 2008 yilda Yevropa yadroviy tadqiqotlar tashkiloti (CERN) tomonidan Jeneva, Shveysariya yaqinida qurilgan yirik adron kollayderi (LHC). U proton nurlarini 6,5 tera energiyagacha tezlashtira oladi elektronvoltlar (TeV yoki 10^{12} eV).

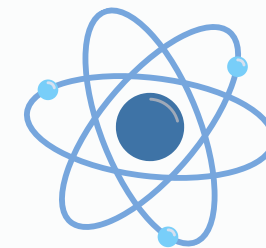


Sinxrotron printsipi 1944 yilda Vladimir Veksler tomonidan ixtiro qilingan. Edvin Makmillan 1945 yilda birinchi elektron sinxrotronni yaratdi va Vekslerning kashfiyotidan bexabar holda mustaqil ravishda dunyoga tanitdi (bu faqat Sovet jurnalida mavjud edi, garchi ingliz tilida bo'lsa ham). Birinchi proton sinxrotroni ser Markus Olifant tomonidan ishlab chiqilgan va 1952 yilda qurilgan.





$$E=mc^2$$



3.SINXROTRON QURILMASINING AFZALLIKLARI VA QULAYLIKLARI

Sinxrotron — bu elektronlarni yorug'lik tezligiga yaqin tezlikda aylantirib, o'ta kuchli va aniq nurlanish (sinxrotron nuri) oladigan ulkan qurilmadir.

Uning asosiy afzalliklari quyidagilardan iborat:

O'ta yuqori yorqinlik: Sinxrotron nuri oddiy rentgen apparatlaridan millionlab marta yorqinroq. Bu moddalarning hatto atom darajasidagi tuzilishini ko'rish imkonini beradi.

Keng spektrli nurlanish: Bir vaqtning o'zida infraqizil, ultrabinafsha va rentgen nurlarini olish mumkin. Olimlar o'zlariga kerakli to'lqin uzunligini tanlab ishlatishlari mumkin.

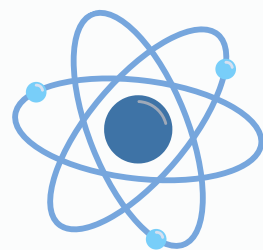
Yuqori aniqlik (Rezolyutsiya): Juda kichik hajmdagi namunalar yoki mikroskopik jarayonlarni (masalan, viruslarning hujayraga kirishi) real vaqt rejimida kuzatish imkonini beradi.

Tezkorlik: Jarayonlar soniyaning milliarddan bir ulushida sodir bo'lganda ham, sinxrotron ularni "tasvirga tushira" oladi. Bu kimyoviy reaksiyalarni o'rganishda juda qo'l keladi.

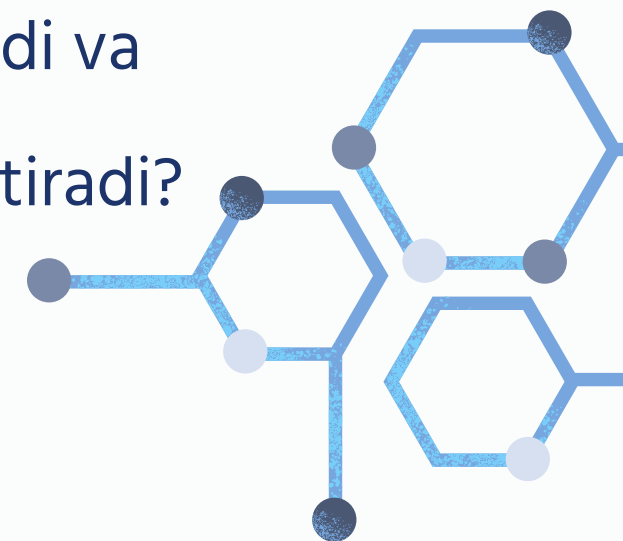
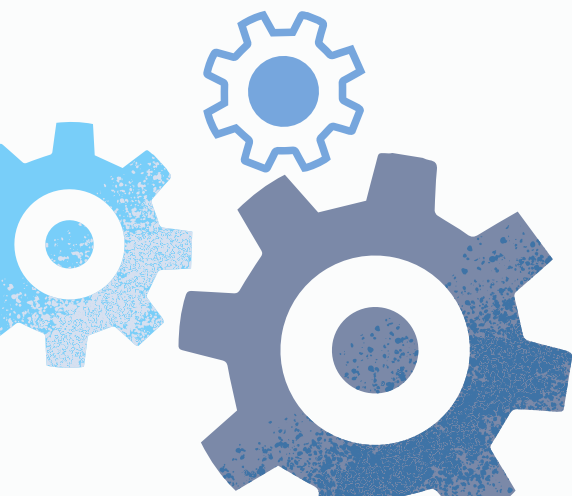
Ko'p tarmoqlilik: Bitta qurilmadan bir vaqtning o'zida biologlar, fiziklar, kimyogarlar va muhandislar turli laboratoriyalarda (beamlines) foydalanishi mumkin.

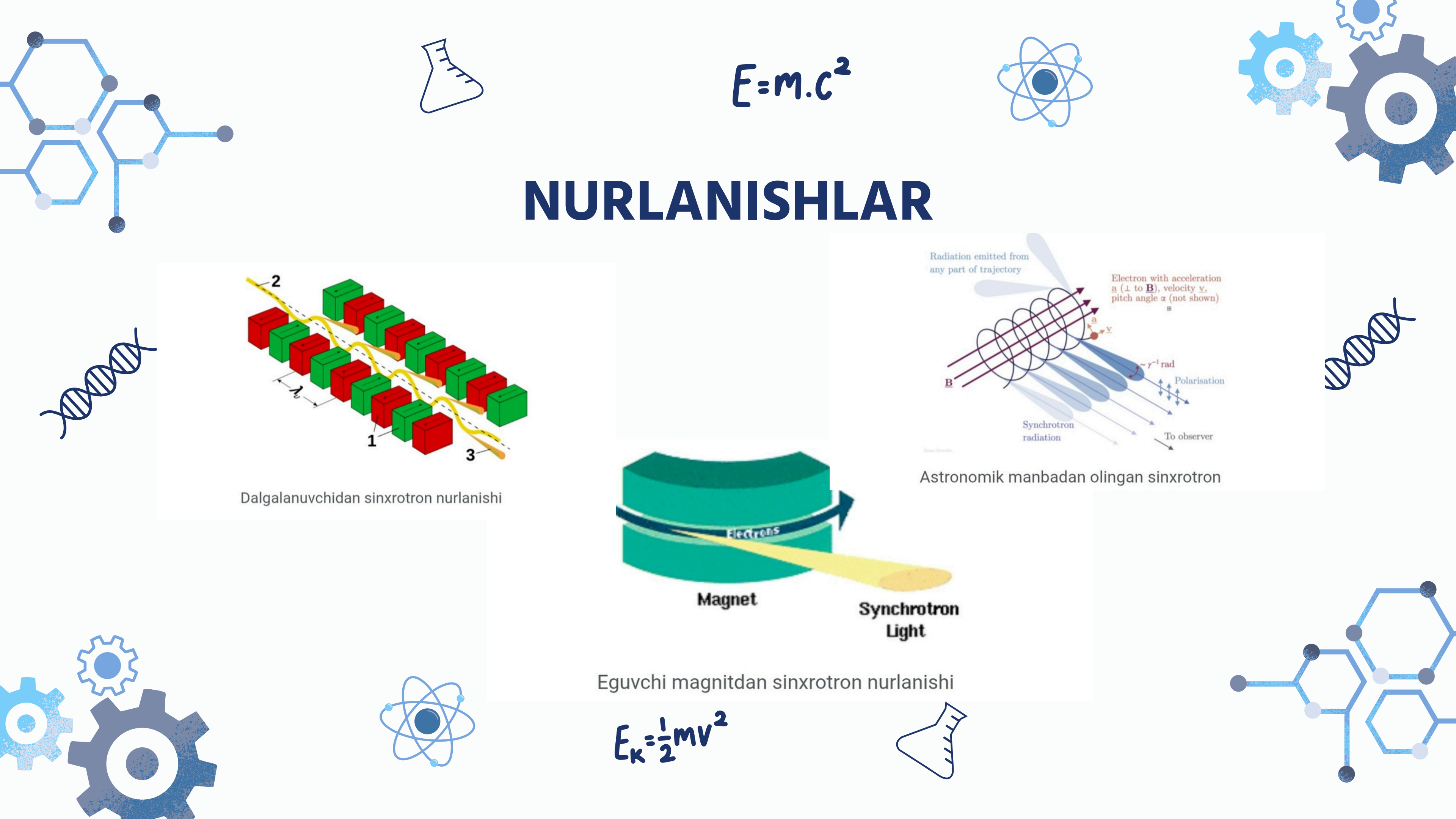
Ushbu qurilmalar yordamida yangi dori-darmonlar yaratiladi, mikrochiplar takomillashtiriladi va qadimiy osori-atiqalar ularga zarar yetkazmagan holda tadqiq qilinadi.

Sizni aynan qaysi sohadagi (masalan, tibbiyot yoki materialshunoslik) tatbiqi ko'proq qiziqtiradi?



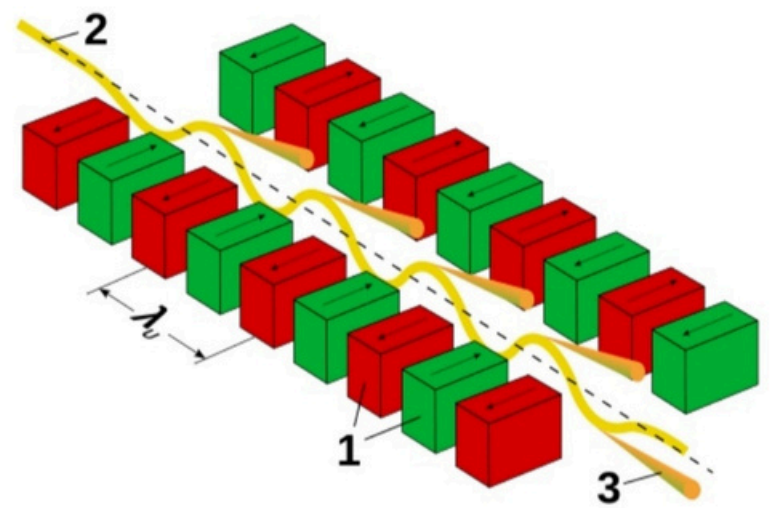
$$E_k = \frac{1}{2}mv^2$$



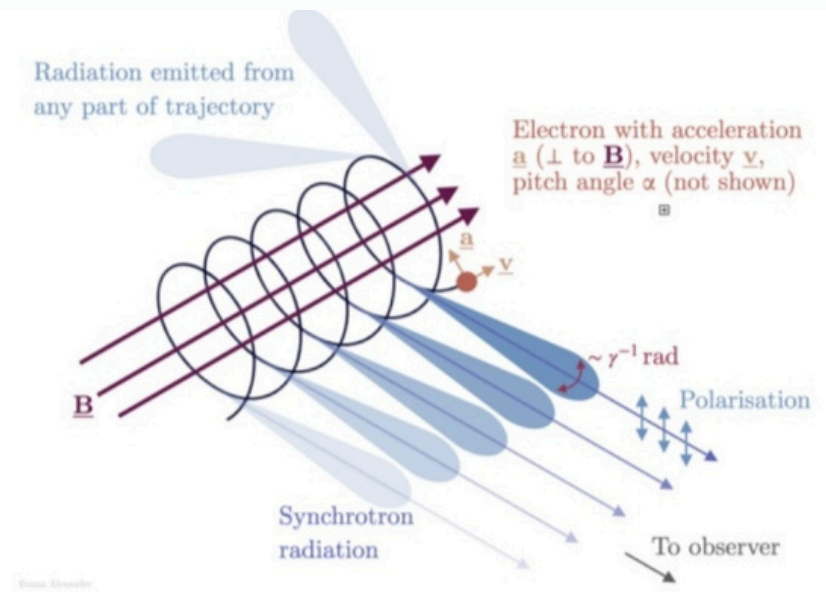


$$E = m \cdot c^2$$

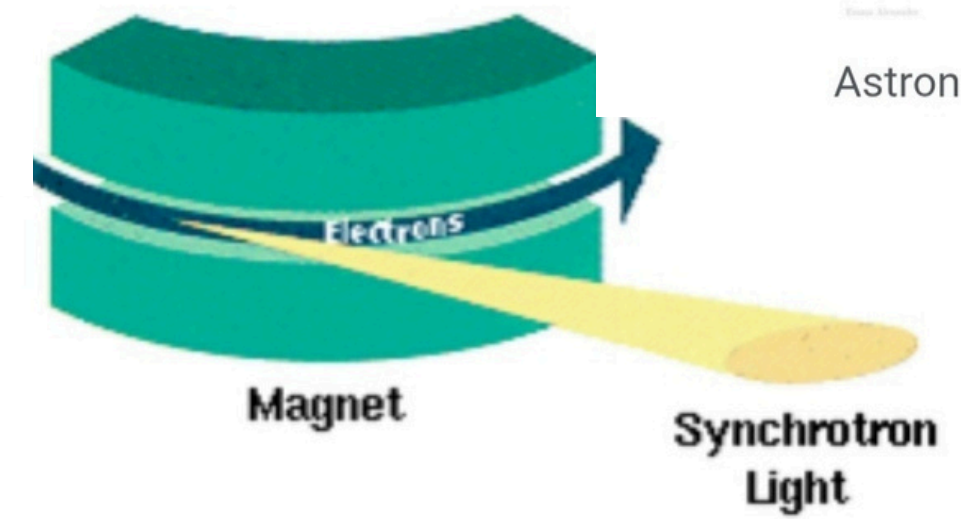
NURLANISHLAR



Dalgalanuvchidan sinxrotron nurlanishi



Astronomik manbadan olingan sinxrotron

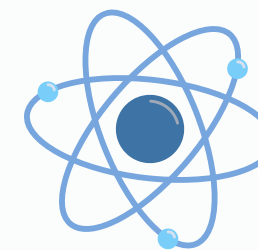


Eguvchi magnitdan sinxrotron nurlanishi

$$E_k = \frac{1}{2} m v^2$$

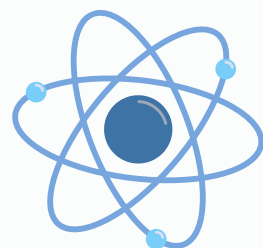
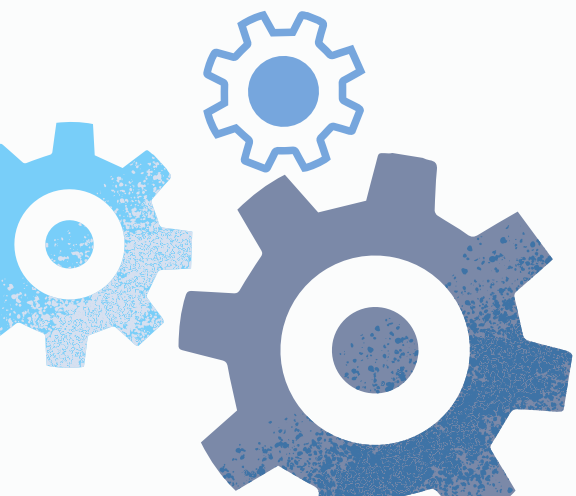


$$E=mc^2$$



Sinxrotron qurilmalari va ularning rivojlanish bosqichlari:
Sinxrotron nurlanishi bugungi kunda ilm-fan va texnologiyaning bir qator sohalarida keng qo'llanilmoqda. Uning yuqori intensivligi, keng spektral diapazoni va yuqori polarlyatsiya xususiyatlari uni laboratoriya tadqiqotlarida noyob va samarali vositaga aylantiradi. Sinxrotron nurlanishi birinchi navbatda fizikada, materiallar va biologik tizimlarni o'rganishda, tibbiyotda va sanoatda keng qo'llanilmoqda. Ushbu nurlanishning zamonaviy qo'llanilishi va uning kelajakdagi istiqbollari bo'yicha ilmiy tadqiqotlar va texnologik rivojlanishlar davom etmoqda.

Sinxrotron nurlanishining eng keng tarqalgan qo'llanilishi materiallar fizikasi va nanoteknologiya sohalarida bo'lib, bu sohalarda u yangi materiallar va nanomateriallar yaratishda, ularning strukturasini va xossalarini o'rganishda samarali vosita hisoblanadi. Sinxrotron nurlanishi yordamida materiallarning elektron tuzilishi, kristallar tuzilishi, qatlamlar o'rtasidagi o'zaro ta'sirlar va boshqa mikroskopik o'lchovlar aniq va yuqori aniqlikda tahlil qilinadi. Bu jarayonlar yangi, yanada kuchli va samarali materiallarni ishlab chiqishga imkon beradi. Misol uchun, sinxrotron nurlanishi quyosh batareyalarini yaratish va ularning samaradorligini oshirishda muhim ahamiyatga ega bo'lishi mumkin.



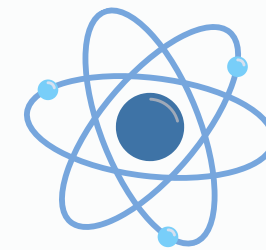
$$E_k = \frac{1}{2}mv^2$$





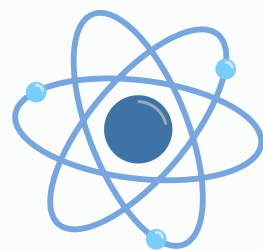
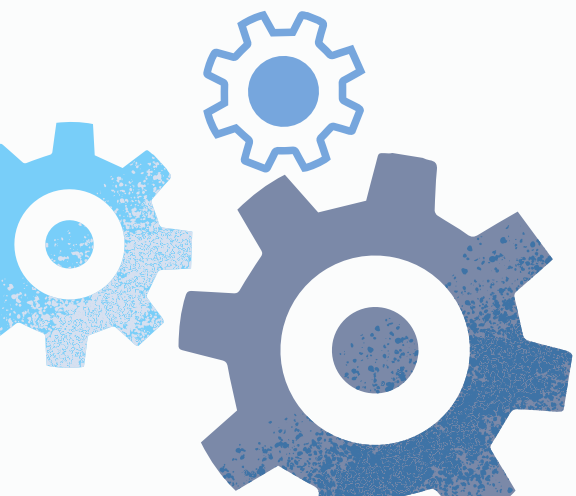
$$E = m \cdot c^2$$

XULOSA



Sinxrotron nurlanishi o'zining yuqori intensivligi, keng spektral diapazoni va polarlyatsiya xususiyatlari bilan ilm-fan va texnologiyadagi ko'plab sohalarda muhim rol o'ynamoqda. Ushbu nurlanish turi materiallar fizikasidan tortib, tibbiyot, biotexnologiya, ekologiya va arxeologiyagacha bo'lgan keng sohalarda qo'llaniladi. Sinxrotron nurlanishi yordamida mikroskopik darajada materiallarning elektron tuzilishi, kristall tuzilishi, molekulyar tuzilishi, biologik tizimlarning faoliyati, shuningdek, tarixiy artefaktlarning tarkibi tahlil qilinadi.

Kelajakda sinxrotron nurlanishi texnologiyalarining rivojlanishi yanada tezlashadi. Yangi sinxrotron qurilmalar va tizimlar yordamida ilmiy tadqiqotlar va sanoatning yangi sohalarini rivojlantirish imkoniyatlari ochiladi. Sinxrotron nurlanishining yuqori aniqligi va energiya samaradorligi ilm-fan, texnologiya va tibbiyotning kelajagini shakllantirishda muhim ahamiyatga ega bo'ladi. Shu tariqa, sinxrotron nurlanishining imkoniyatlari ilmiy kashfiyotlar va texnologik innovatsiyalar sohasida yangi ufqlarni ochadi.

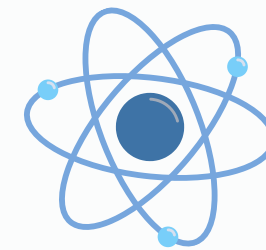


$$E_k = \frac{1}{2}mv^2$$





$$E=mc^2$$



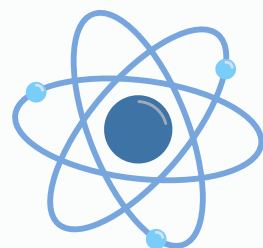
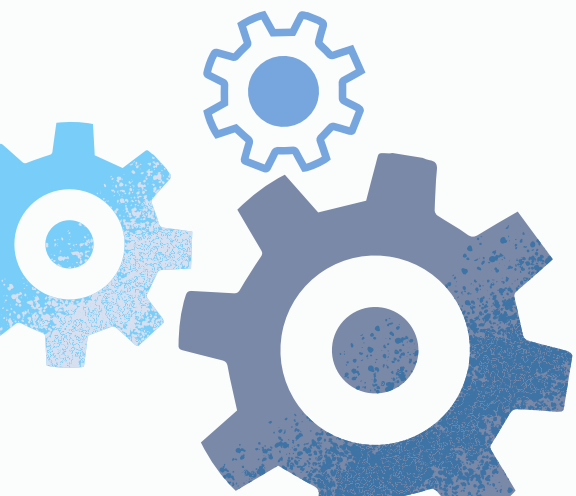
FOYDALANILGAN ADABIYOTLAR

1.Henke, B. L., Gullikson, E. M., & Davis, J. C. (1993). X-ray interactions: photoabsorption, scattering, transmission, and reflection at $E = 50\text{-}30000$ eV, $Z = 1\text{-}92$.

Atomic Data and Nuclear Data Tables

. S.R.Polvonov - Tezlatkichlar fizika

si





E'TIBORINGIZ UCHUN RAHMAT