

[14:10] <TnPearl> what is topic for today
[14:11] <Annie> i don't know, i wasn't here last week
[14:11] <TnPearl> lol
[14:11] <Doos> pyro-piezo electricity and enatiomorphism in quartz
[14:11] <Scott> I think it is umm Quartz stuff
[14:11] <TnPearl> uh
[14:12] <Scott> ok that was to much of a mouth full doos :-(I can't remember that sheesh in laymans terms?
[14:12] <Doos> don't worry, it will be easy
[14:12] <TnPearl> lol
[14:14] <Scott> lol ok I take your word for it.
[14:14] <Doos> we could sum up all the properties of quartz, but you can read them everywhere .. so probably more interesting if we tackle the specific phenomina that quartz has
[14:14] <Frank> Doos and annie always make it understandable :)
[14:15] <Frank> Ok I'm back
[14:15] <Scott> yeah does soudn good to me and Yes they do make it easy to understand.
[14:15] <TnPearl> thats true
[14:15] <Doos> shall we start?
[14:15] <Doos> ready Annie?
[14:15] <Annie> yep , sure
[14:15] <Doos> next week we'll do the different forms of quartz, like cryptocrystalline etc
[14:16] <Doos> this week and 3 difficult words
[14:16] Cattrix (~Cattrix@172.196.6.57) joined #yg.
[14:16] <Doos> usually atoms in minerals are nicely packed on geometrical shapes
[14:16] <Doos> hi Cattrix, just in time
[14:16] <TnPearl> hey Cat
[14:16] <Frank> hey Cat
[14:16] <Annie> hi cat how you doing
[14:17] <Scott> hey cat
[14:17] <Cattrix> ☺Hello sorry I am late I am having connection problems
[14:17] <Doos> we just started
[14:17] <Doos> I'll start over
[14:17] <Doos> so, usually atoms in minerals are nicely packed on geometrical shapes
[14:18] <Doos> like lego blocks upun eachother
[14:18] <Doos> it was discovered that in quartz that is not the case
[14:18] <Doos> instead the atoms are organised helical, as in a spiral staircase
[14:19] <Frank> Is this the reason for the bullseye optic character?
[14:19] <Doos> or like dna strings
[14:19] <Doos> yah
[14:19] <Doos> we know that light gets polarized in anisotropical minerals
[14:20] <Doos> vibrating in two directions
[14:20] <Doos> everyone remember that?
[14:20] <Frank> yes
[14:21] <Doos> so if the atoms in quartz spiral, you can imagine that the polarized light in quartz follows the spiral
[14:21] <Doos> creating circular poarization
[14:21] <Frank> rotating plane polarised light?
[14:21] <Doos> yah
[14:21] <Frank> hoo wee it's nice two seperate bits of info collide to form understanding

[14:22] <Doos> is that understandable all .. say no if it's not
[14:22] <Frank> I don't think scott and pearl were at the chats when this was discussed
[14:22] <Frank> dunno bout that Cat though
[14:22] <TnPearl> not really
[14:23] <Frank> does the light spiral in both diractions?
[14:23] <Doos> okay, let me explain by example
[14:23] <Annie> sorry doos, can i interrupt for a moment
[14:23] <Scott> I wasn't there but I think I understand.
[14:23] <Doos> no frank
[14:23] <Frank> directions. (of ppl)
[14:23] <Doos> sure Annie
[14:23] <Doos> Frank, only one way at a time
[14:23] <Frank> ok
[14:23] <Doos> we'll get to that in a bit
[14:24] <Doos> Annie
[14:24] <Annie> yeah, i was going to ask
[14:24] <Annie> you said last chat when this was discussed
[14:24] <Frank> long time ago annie
[14:24] <Annie> from what i can see you discussed spectra last week,
[14:25] <Frank> last winter
[14:25] <Doos> uh, no we discussed polarized light long ago Annie
[14:25] gemma (~gemma@68.249.43.237) joined #yg.
[14:25] <Frank> we did rotating polarised light
[14:25] <Doos> hi gemma
[14:25] <Annie> oh ok, i thought you were going on about last week
[14:25] <TnPearl> hey gemma
[14:25] <Doos> nah Annie
[14:25] <gemma> hi. laptop problems. sorry
[14:25] <Cattrix> ☐030h then I was not here for that..
[14:25] <Annie> hi gemma
[14:25] <Frank> hi gemma
[14:25] <Cattrix> ☐03me TOO Gemma Hi
[14:25] <Doos> okay, I'll explain by example
[14:25] <TnPearl> k
[14:26] <gemma> hi annie, everyone, im just gonna do my usual watch and interruipt now and tehn
[14:26] <Scott> opps hi gemma
[14:26] <Annie> hi you welcome gemma,
[14:26] <Frank> lol...that means allatime
[14:26] gemma (~gemma@68.249.43.237) left #yg.
[14:26] <Doos> when light enters a mineral, it gets polarized .. meaning it only vibrates in certain ways
[14:27] <TnPearl> k
[14:27] <Doos> then as it leaves the stone, the polarized light combines again into circular light (as it was)
[14:28] gemma (~gemma@68.249.43.237) joined #yg.
[14:28] <Doos> we'll cover plain polarized light again to explain that again
[14:28] <Doos> but important for today is that polarized light travels in one direction .. so straight through the stone
[14:29] <Doos> like an arrow shooting through it
[14:29] <TnPearl> k
[14:29] Scott (~Scott@202.131.179.244) left irc: Scott
[14:30] <Doos> if you have a normal ladder and put your finger on one railing (is that a good word) .. you will see that your finger goes in a straight line up
[14:30] Scott (~Scott@202.131.179.244) joined #yg.

[14:30] <Doos> right?
[14:30] <Catrix> ☐03ok
[14:30] <Frank> rung is better for ladder....rail for staircase
[14:31] openmind (~openmind@201.19.114.97) joined #yg.
[14:31] <gemma> (step for staircase)
[14:31] <Doos> same with a light .. it will go straight up till it reaches the end
[14:31] <Annie> hi Openmind
[14:31] <Doos> hi openmind
[14:31] <Scott> hi openmind
[14:31] <gemma> question
[14:31] <Frank> ok...but rail for to put your hand on
[14:31] <openmind> hello... did I get the time right this time?
[14:31] <Doos> yes gemma
[14:31] <TnPearl> hi openmind
[14:31] <Frank> lol...only 30 mins late this week
[14:31] <gemma> so i don't get confused . . .
[14:32] <gemma> is the light still doing it's spiral or side to side motion as it goes directly through the stone
[14:32] <gemma> or is it in an absolute straight line
[14:32] <openmind> well.. it's an improvement, considering my past history!
[14:32] <Annie> glad you can make it,
[14:32] <Doos> in the noraml situation it goes straight up .. (but this is for a small example)
[14:33] <gemma> ok. i'll jus shut up and listen and ask later if i don't get it so as not to confuse or side track. i'm ok with that
[14:33] <Doos> so it travels in one plane (well actually two, but that's not important in this example)
[14:34] <gemma> ok in the one plane but it still has it's wave movement, right?
[14:34] <gemma> the troughs and crests or whatever they are called
[14:34] <Doos> now if you have a spiral staircase and let the light follow the rail .. it will make a circular motion when you look at it from above, right?
[14:34] <Doos> yes gemma
[14:34] <TnPearl> yes
[14:34] <gemma> ty. yes
[14:35] <Doos> now if you imagine the light is a polarized plane .. you have circular polarization
[14:35] <TnPearl> ok I get it ty
[14:35] <gemma> oh, me too
[14:36] <Doos> which is just normal polarized light, only it follows the steps of the spiral staircase
[14:36] <TnPearl> ok
[14:36] <TnPearl> light went on
[14:36] <Doos> good, scott, Catrix, Frank?
[14:36] <gemma> plane polarized light went on
[14:36] <Doos> heh
[14:36] <Catrix> ☐03yes
[14:36] <Frank> question
[14:36] <TnPearl> lol
[14:36] <Doos> yes Frank
[14:36] <Scott> Yeap yeap
[14:37] <Frank> when we look at normal ppl then all the rays vibrate in the same direction
[14:37] <Doos> two directions

[14:37] <Frank> with rotating ppl does the vibration direction change as it goes around the spiral

[14:38] <Doos> yes

[14:38] <Doos> for both rays

[14:38] <Frank> so there would be a different vibration direction for each part of the rail

[14:38] <Doos> it starts to rotate like a spinning toy

[14:39] <Doos> yes of course

[14:39] <Frank> looked at face on wouldn't that look like normal white light ie rays pointing of in all directions

[14:40] <Doos> no

[14:40] <Frank> sorry not rays....vibration directions

[14:40] <Doos> it still only vibrates in two directions it just spirals

[14:41] <Frank> ok ty

[14:41] <Doos> makes a cross from your hands

[14:41] <Doos> then rotate it on one wrist

[14:41] <Frank> ah...

[14:41] <Frank> ok that's clear(er)

[14:41] <Doos> see it now?

[14:41] <Frank> yes

[14:41] <Doos> Annie, you have something to add while I potty :)

[14:42] <Annie> Doos, we are going pretty fine here.

[14:43] <Doos> okay

[14:43] <Doos> now where were we

[14:43] <Doos> oh yes

[14:43] <Doos> now quartz can spiral in two way

[14:43] <Doos> left and right

[14:43] <Doos> like a staircase could

[14:44] <Doos> so you have two possibilities .. the two being an exact mirror of each other

[14:44] <Doos> that effect is named enantiomorphism

[14:45] <Doos> or phenomena rather

[14:45] <Frank> this is the right and left handed crystal with the trigonal prism shape?

[14:45] <Doos> the effect of that can be seen in the typical "bull's-eye" under a polariscope

[14:45] <Doos> yes

[14:46] <Frank> side note ; (if you have Peter G. Reid's book "Gemmology" 2nd edition you can see a pic on page 39)

[14:47] <Doos> some crystals are said to be lefthanded or righthanded, depending on which way they spiral and can be seen in some crystal rhombohedral faces (if present)

[14:47] <Doos> around page 203 in Gems by Webster

[14:47] <Doos> any questions?

[14:47] <Frank> if the crystal is twinned would they have a right and left handed side?

[14:48] <Catrix> ☐03 you are talking about the layers of the crystal structure and the way they are formed correct?

[14:48] <Frank> or is that down to chance

[14:48] <Frank> faces cat

[14:48] <Frank> on the crystal

[14:48] <Frank> but layers inside

[14:48] <Catrix> ☐03 ok

[14:49] <Doos> Frank, almost all show the bull's-eye except for Amethyst .. due to twinning (although twinning is common for all quartz)

[14:49] <Frank> I'm sure about the crystal faces (I've got the book) not sure if a helix is "layered" though ... doos?...annie?

[14:49] <Doos> but the crystal faces are only the outer appearance

[14:50] <Frank> yes...but with a good crystal you may be able to say if it's left or right hande

[14:50] <Doos> yes

[14:50] <Frank> sorry I'm on my crystallography high horse again...I'll shut up and let you continue

[14:51] <Doos> heh, thats okay

[14:51] <Frank> you and annie taught me all this stuff anyway so it's your own fault

[14:51] <Doos> you can also test it with hydrofluoric acid, but don't try that at home

[14:51] <TnPearl> lol

[14:51] <Annie> due to the enantiomorph structure, there is no centre of symmetry

[14:52] <Catrix> □03it is like plates lapped against each other building up in a spiral?

[14:52] <Frank> I never thought of that annie ..but it makes good sense

[14:53] <Doos> you could look at it that way for a visual Catrix

[14:53] <Frank> sort of a cat in the hat plate stack

[14:53] <Annie> yeah, but the outside of crystal will look preety much trigonal since the crystal will be either singly or doubly terminated

[14:53] <Catrix> □03ok

[14:54] <Frank> cept for the rhombahedral faces near the terminations

[14:54] <gemma> question

[14:54] <Doos> yes gemma

[14:54] <Annie> yes

[14:55] <gemma> i came in late. what is the significance of knowing whether the quartz

[14:55] <gemma> umm

[14:55] <Doos> because it explains the bulls-eye and only quartz shows this

[14:55] <gemma> i think you are talking about polarizng two different ways?

[14:56] <Doos> yah, plane polarized light and circular polarization

[14:56] <gemma> and you are saying quartz does this both ways?

[14:57] <Doos> well circular is just plane which spirals

[14:57] <gemma> duh. ok. i'll get it. thanks

[14:57] <Frank> dont ask about elliptical lol

[14:57] <Doos> and it can spiral in both ways

[14:57] <gemma> (frank you are doing a fine job messing them up on your own)

[14:57] <gemma> ok. spiral in both ways

[14:58] <Doos> but only one way at a time

[14:58] <gemma> that is important to understnad for whatyou are tyring to explain?

[14:58] <Doos> the bulls-eye

[14:58] <gemma> oh! got it.

[14:58] <gemma> done

[14:58] <Doos> okay on to electricity?

[14:59] <Catrix> □03ok

[14:59] <Doos> there are two phenomena that are allied, pyroelectricity and piezoelectricity

[15:00] <Doos> of all the gems we know, only quartz and tourmaline show this

[15:00] <Doos> pyroelectricity means that the crystal will get an electrical charge when heated (pyro=fire)

[15:01] <Doos> like in a pyromanic person

[15:01] <Annie> firey

[15:01] <Doos> I'm sure Catrix can name a good use for this

[15:01] <Cattrix> □03?
[15:02] <Doos> you won the quiz on that
[15:02] <Cattrix> □03oh for collecting dust or ashes?
[15:02] <Annie> the ash collector
[15:02] <Doos> yes
[15:03] <Doos> when heated, the crystal will get a positive charge on one end and a negative charge on the other
[15:03] <Doos> like a magnet
[15:03] <Doos> did I explain that correct Frank? you're the electrician here
[15:04] <Frank> Yes
[15:04] <Annie> also useful for controlling radio wave frequencies in clocks which would pulsate in accuracy of 32768 per cycle/seconds
[15:04] <Frank> like a magnet
[15:04] <Frank> indeed becomes a magnet
[15:05] <Frank> but faint field
[15:05] <Frank> though stronger in tourmaline than quartz (according to CC)
[15:05] <Doos> it were the dutch who first used that as the brought back the tourmaline from Ceylon, but quartz also shows it
[15:05] <Frank> yes...my lighter and watch both use quartz
[15:05] <Doos> yes it's mainly tourmaline that is famous for this
[15:06] <Doos> that is piezo Frank .. will come to that in a bit
[15:06] <Frank> ah...course. sorry
[15:07] <Doos> any questions or additions on this?
[15:07] <TnPearl> no
[15:07] <gemma> yes
[15:07] <Doos> yes gemma
[15:07] <Cattrix> □03keep going I will be right back.
[15:07] <gemma> is this the same silicon thing that makes computer chips work
[15:08] <Doos> yes that is synthetic quartz
[15:08] <gemma> ty
[15:08] <Doos> but I think they use piezo for that aswell
[15:09] <Frank> do tourmaline and quartz both have pyro and piezo qualities
[15:09] <Doos> yes
[15:09] <Doos> any mineral that has the one, also has the other
[15:09] <Annie> yes the famous 2 families like us
[15:09] <Frank> ok ty :)
[15:09] <TnPearl> ok I got a silly question
[15:10] <TnPearl> are we talking about all quartz or just certain kinds
[15:11] <Doos> all
[15:11] <TnPearl> ok ty
[15:11] <Doos> if you ever wonder why your tourmalines collect so much dust when you lay them in a shopwindow, now you know
[15:12] <Doos> the causes lie in the fact that these minerals form different on opposite ends of the crystal
[15:13] <Doos> so there is a tension in the mineral
[15:13] <Doos> on to piezoelectricity?
[15:13] <gemma> creating the spiral thing
[15:13] <openmind> that's a great way of knowing if a seller is carefull with his gems... check tourmalines and quartz kept in the open and exposed to strong light
[15:14] <Doos> lol yes
[15:14] <Doos> yes gemma
[15:14] <openmind> it's true
[15:14] <Scott> lol

[15:14] <Doos> might be a great salestool openmind
[15:14] <Annie> good one
[15:14] <openmind> that's something to always check in stores
[15:14] <Catrix> ☐03so quartz will collect dust quickly too... correct
[15:15] <Annie> no doubt there
[15:15] <Doos> not to the extend as tourmaline Catrix, but yes
[15:15] <Catrix> ☐03ok
[15:15] <openmind> tourmaline gets dirty pretty fst, but quartz is the second runner up
[15:16] <openmind> oops.. sorry Doos...
[15:16] <Doos> no good one
[15:16] <openmind> just from experience, my tourmalines get a lot worse then quartz
[15:16] <Doos> so this boring theory has some function huh?
[15:16] <openmind> they need taking care of a lot... :)
[15:17] <openmind> well.. sorry for distracting all.. I'll keep quiet again
[15:17] <Doos> you're doing great
[15:17] <Doos> ok, piezo electricity
[15:17] <Doos> piezo means stress (in greek I believe)
[15:18] <Doos> or pressure
[15:18] <Doos> this means that if you apply to quartz, it will start to vibrate
[15:19] <Doos> if you apply an electrical current to a special selected part of quartz, it starts to bend (so the electricity acts as the bender)
[15:21] <Doos> then when the electrical current (from a battery or something) the quartz will jump back to his old form and creates a vibration
[15:21] <Doos> just like a stemfork
[15:21] <Doos> it will produce a specific frequency
[15:21] <Doos> such quartz stemforks are used in digital watches
[15:22] <Doos> questions?
[15:23] <Frank> how often do you need to "wind it up"
[15:23] <Doos> lol
[15:24] <Frank> apply pressure and / or electricity
[15:24] <Frank> let me rephrase
[15:24] <Doos> didigital watches you don't wind
[15:24] <Frank> how long will the stemfork vibrate?
[15:25] <Frank> before requiring another jolt
[15:25] <Doos> I think it's a matter of 1/1000000000 /second orso .. have no clue really
[15:26] <TnPearl> it is in the watch course
[15:26] <TnPearl> If I remember
[15:26] <TnPearl> right
[15:26] <Doos> can't remember
[15:26] <Frank> small then :) it's the constant rate of the wavelength that makes it good for watches?
[15:26] <openmind> http://en.wikipedia.org/wiki/Crystal_oscillator
[15:26] <Doos> yes, the constant makes for the great use of it
[15:27] <Frank> and when pressure is applied it will produce electricity...enough to make a spark?
[15:27] YG695 (~gemma@68.249.43.237) joined #yg.
[15:27] <YG695> dell
[15:27] YG695 (~gemma@68.249.43.237) left irc: YG695
[15:28] YG517 (~gemma@68.249.43.237) joined #yg.
[15:28] <Doos> frank, all my lighters use a flint
[15:28] <Frank> lol....I like my ads short and sweet
[15:28] YG517 (~gemma@68.249.43.237) left irc: YG517

[15:28] <Doos> heh
[15:28] <Frank> mine to i'm just trying to look sophisticated
[15:28] <Doos> lol
[15:29] <TnPearl> your so posh Frank
[15:29] <TnPearl> lol
[15:29] <TnPearl> did I spell that right
[15:29] <Doos> so, pyroelectricity has to do with heat and
pizelectricity has to do with pressure
[15:29] <Frank> but they do make sparky quartz jobbies...and I've often
wondered but never looked up how they work
[15:30] <Doos> nice homework assignment Frank
[15:30] <Frank> yes posh pearl...did you know it means port out starboard
home
[15:30] <Frank> ok I'll tell you next week
[15:30] <Doos> Annie, I'm sure you have loads to add
[15:30] <TnPearl> thats what you said about me
[15:30] <TnPearl> LOL
[15:30] <Frank> your sophisticated and posh
[15:30] <TnPearl> ok
[15:31] <TnPearl> LOL
[15:31] <Frank> (y)
[15:31] <Doos> did everyone understand these concepts?
[15:31] <Frank> yes
[15:31] <TnPearl> sorry doos
[15:31] <Scott> *thumbs up*
[15:31] <Catrix> ☐03I think so :)
[15:31] <TnPearl> yes
[15:32] <openmind> yes
[15:32] <Doos> you don't need to go into it too deep, just a basic
understand is good, so when a customer ever asks you how a digital clock
works .. you now know
[15:33] <Doos> "a quartz stemfork get bend by an electrical current from
the battery .. it starts to vibrate and the chip reads the vibration"
[15:34] <Doos> for the rest consult you watchrepair department :)
[15:35] <Doos> all fell asleep?
[15:35] <Catrix> ☐03no ehehe
[15:35] <Frank> no I'm watching with bated breath
[15:35] <Scott> lol nope not yet :-)
[15:36] <Catrix> ☐03hard to type in prone position
[15:36] <Scott> writing notes lol so I can understand this all aagain if
I forget
[15:36] <Doos> heh, and when you need to sell a tourmaline you'll point
out the pyroelectric effect and that the dutch used it as an
"aschentrekker" to clean their pipes
[15:36] <Frank> is there a way to test for pyro / piezo
electricalness...as a means to ID qurtz or tourmaline?
[15:37] <Doos> Frank, heat up the tourmaline and start vaccuuming your
desk :)
[15:38] <Annie> Doos, please excuse me tonight, but have to go..ok
everyone, I am going to make a slow exit from here, if you will all
excuse me.
[15:38] <Frank> hardly scientific but it'll do...I'll have to get a
little car vacuum cleaner for field trips
[15:38] <TnPearl> bye Annie
[15:38] <Catrix> ☐03Bye Annie
[15:38] <TnPearl> have a good night
[15:38] <Frank> bye annie
[15:38] <Doos> that's okay Annie, hugs

[15:38] <Annie> had a very hard day...
[15:38] <openmind> bye, Annie!
[15:39] <Annie> bye
[15:39] <Scott> bye annie
[15:39] <Doos> till soon Annie
[15:39] <Frank> sleep late tomorrow annie...hugs
[15:39] <Annie> see you
[15:39] Annie (~Annie@203.61.91.252) left #yg.
[15:39] <Doos> we were ready I guess
[15:40] <TnPearl> ready for what
[15:40] <Doos> with the topics :)
[15:40] <Doos> I should have said "done"
[15:40] <TnPearl> oh I thought it was very good
[15:40] <TnPearl> oh
[15:40] <Frank> I second pearl
[15:40] <Catrix> ☐03me too I almost gave up
[15:41] <Doos> so 3 difficult words that are not so hard to understand ..
or did I loose someone?
[15:41] <Catrix> ☐03when I had problems connecting this AM
[15:41] <TnPearl> If you didn't loose me you done a very good job
[15:41] <TnPearl> lol
[15:41] <Scott> no but I still dont' want to say them out loud lol.
[15:41] <openmind> it was great... and I didn't even get to see it all!
:)
[15:42] <Doos> the log will be posted soon openmind
[15:42] <openmind> ok.. I'll go through it
[15:42] <Frank> enantiomorphism...sheeit it's even hard to type never
mind say aloud
[15:42] <Catrix> ☐03lol
[15:42] <Scott> lol yeah no doubt.
[15:43] <Doos> lol
[15:43] <TnPearl> not a word a southerner will say out loud
[15:43] <Catrix> ☐03Peizoelectricity
[15:43] <TnPearl> lol
[15:43] <TnPearl> that either
[15:43] <openmind> I wonder how someone would react if I called them
that?
[15:43] <Doos> heh
[15:43] <Scott> lol
[15:44] <TnPearl> don't know if I would try LOL
[15:44] <openmind> lol...
[15:45] <Catrix> ☐03Great lesson, now I have to find some breakfast..
[15:45] <Frank> so...are we done with lessons?
[15:45] <Catrix> ☐03I am failing fast
[15:45] <Doos> yah Frank